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INSTITUTE OF GRADUATE STUDIES
DEPARTMENT OF CHEMISTRY

PREPARATION OF A NATIONAL REFERENCE MATERIAL PESTICIDE MIXTURE: FEASIBILITY STUDIES FOR PRODUCTION

MASTER OF SCIENCE, CHEMISTRY

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ACCEPTANCE AND APPROVAL PAGE

The thesis entitled "**PREPARATION OF A NATIONAL REFERENCE MATERIAL PESTICIDE MİXTURE: FEASIBILITY STUDIES FOR PRODUCTION**" prepared and submitted by **Hatice KILINÇ** in partial fulfillment of the requirements for the degree of **Master of Science** in Department of **CHEMISTRY** with unanimity vote is hereby approved. 3/24/2025

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ABSTRACT

PREPARATION OF A NATIONAL REFERENCE MATERIAL PESTICIDE MİXTURE: FEASIBILITY STUDIES FOR PRODUCTION
MSC THESIS
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Feasibility studies were carried out with the aim of preparing a national reference pesticide mixture. Two main mixtures (mixture 1 and mixture 2) were prepared using a total of 108 pesticides, mixture 1 contains 24 pesticides, while mixture 2 contains 84 pesticides, mixtures were prepared twice using by gravimetric method (mix A and mix B) and once using by volumetric method (mix C), HCB, metolachlor, α-HCH, γ-HCH, aldrin, dieldrin, endrin, 4,4'-DDD, 4,4'-DDT, 2,4'-DDT, α-endosulfan, β-endosulfan, heptachlor and heptachlor endo-epoxide were analysed in gravimetric mixtures, and except for HCB, metolachlor, heptachlor endo-epoxide, the same pesticides were analysed in volumetric mixtures. Short- and long-term stability tests of organochlorine pesticides were undertaken at 20°C to determine transport behaviour, and at +4°C and -20°C to determine behaviour under optimal storage conditions. The most stable temperature was considered as -20°C. There is no significant change in the concentration of the pesticides determined weekly and monthly in the mixtures over a period of 5 months. The uncertainty of these pesticides was calculated with respect to the uncertainty of homogeneity, short- and long-term stability, purity of standards, GC-MS calibration plot and uncertainty of characterization according to ISO Guide 17034. Consequently, the expanded uncertainty results for HCB, metolachlor, α-HCH, γ-HCH, aldrin, dieldrin, endrin, 4,4'-DDD, 4,4'-DDT, 2,4'-DDT, α-endosulfan, β-endosulfan, heptachlor and heptachlor endo-epoxide were determined around 0.5, 0.7, 0.5, 0.5, 0.3, 0.2, 0.4, 0.6, 0.8, 0.7, 0.3, 0.3, 1.2 and 0.5 in gravimetric mixtures for 100 ppm. In volumetric mixture, their expanded uncertainties were determined to be 2.4, 3.1, 4.1, 2.7, 15. 2.8, 4.1, 3.9, 3.2, 3.6 and 12.6 for 80 ppm, respectively.

KEYWORDS: Organochlorine pesticide, A national CRM, Gravimetry, Stability, Homogeneity, Uncertainty

ÖZET

ULUSAL SERTİFİKALI REFERANS MALZEME PESTİSİT KARIŞIMININ HAZIRLANMASI: ÜRETİM İÇİN FİZİBİLİTE ÇALIŞMALARI
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Ulusal bir referans pestisit karışımı hazırlamak amacıyla fizibilite çalışmaları yürütülmüştür. Toplam 108 pestisit kullanılarak iki ana karışım (karışım 1 ve karışım 2) hazırlanmıştır. Karışım 1, 24 adet pestisit içerirken, karışım 2, 84 adet pestisit içermektedir. Karışımlar iki kez gravimetrik yöntemle (karışım A ve karışım B) ve bir kez de volumetrik yöntemle (karışım C) hazırlanmıştır. HCB, metolaklor, α-HCH, γ-HCH, aldrin, dieldrin, endrin, 4,4'-DDD, 4,4'-DDT, 2,4'-DDT, α-endosulfan, β-endosulfan, heptaklor ve heptaklor endo-epoksit gravimetrik karışımlarda, HCB ve metolaklor, heptaklor endo-epoksit, hariç aynı pestisitler hacimsel karışımlarda analiz edilmiştir. Organoklorlu pestisitlerin kısa ve uzun vadeli stabilite testleri, nakliye davranışını belirlemek için 20°C'de ve optimum depolama koşulları altındaki davranışı belirlemek için +4°C ve -20°C'de gerçekleştirilmiştir, En kararlı sıcaklık -20°C olarak kabul edilmiştir. Karışımlarda haftalık ve aylık olarak belirlenen pestisit konsantrasyonlarında 5 aylık bir süre boyunca önemli bir değişiklik olmamıştır. Bu pestisitlerin belirsizliği, ISO Guide 17034'e göre homojenlik belirsizliği, kısa ve uzun vadeli stabilite, standartların saflığı, GC-MS kalibrasyon grafiği ve karakterizasyon belirsizliği açısından hesaplanmıştır, Sonuç olarak, HCB, metolaklor, α-HCH, γ-HCH, aldrin, dieldrin, endrin, 4,4'-DDD, 4,4'-DDT, 2,4'-DDT, α-endosulfan, β-endosulfan, heptachlor ve heptachlor endo-epoxide için genişletilmiş belirsizlik sonuçları 0.5, 0.7, 0.5, 0.5, 0.3, 0.2, 0.4, 0.6, 0.8, 0.7, 0.3, 0.3, 1.2 ve 0.5 civarında gravimetrik karışımlarda sırasıyla 100 ppm için belirlenmiştir. Hacimsel karışımlarda ise genişletilmiş belirsizlikler 80 ppm için sırasıyla 2.4, 3.1, 4.1, 2.7, 15, 2.8, 4.1, 3.9, 3.2, 3.6 ve 12.6 olarak belirlenmiştir.

ANAHTAR KELİMELER: Organoklorlu Pestisit, Ulusal CRM, Gravimetri, Stabilite, Homojenlik, Belirsizlik

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LIST OF ABBREVIATIONS AND SYMBOLS

AC	**:** Acetone
AL	**:** Acetonitrile
CL	**:** Confidence Level
CY	**:** Cyclohexane
App	**:** Appendix
CRM	**:**Certificated Reference Material
DDD	**:** Dichlorodiphenyldichloroethane
DDT	**:** Dichlorodiphenyltrichloroethane
EPA	**:** Environmental Protection Academy
GC-MS	**:** Gas Chromatography Mass Spectrometry
HCB	**:** Hexachlorobenzene
HCH	**:** Hexachlorocyclohexane
Ind.	**:** Individual
ISO	**:** International Standardization Organization
ME	**:** Methanol
OCP	**:** Organochlorinated pesticide
PCB	**:** Polychlorobiphenyl
ppm	**:** Parts per million
RM	**:** Reference material
Soln.	**:** Solution
TO	**:** Toluene
u	**:** Uncertainty
U	**:** Expanded uncertainty

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1. INTRODUCTION

Pesticides are chemical substances that are used to protect plants and food from pests, including insects, rodents, fungi, and weeds. They are also used to prevent diseases that are transmitted to humans and animals by blood-feeding arthropods such as ticks, fleas, and mosquitoes, it is important to note that the use of pesticides should be done with care and responsibility to ensure the safety of both humans and the environment. Furthermore, the use of pesticides is essential to protect crops and preserve food.

Pesticide containers are widely utilized across various industries, such as aquaculture, agriculture, and food processing, Also, it is used in transportation, wood storage, forestry, and other biological products. Their versatility and durability make them an ideal choice for a range of applications.

1.1 Pesticides

During the 19th century, sulphur compounds were used as fungicides. while arsenicals were used to protect fruit and vegetables against insects. In the 1930s, chlorinated organic pesticides were developed and widely used until the 1960s. However, it was later discovered that the long-term toxicity of these synthetic organic pesticides increased, and insects developed resistance to these chlorinated compounds. Consequently, farmers switched to organophosphates and carbamates. Chlorinated pesticides were banned in the United States of America (USA) in 1970 by the Environmental Protection Academy (EPA). Although, it is worth noting that some countries continued to use them for a considerable period despite being banned.

The use of pesticides has negative effects on both public and environmental health. It is important to acknowledge the potential harm caused by pesticides and take measures to mitigate their impact on the environment and public health. Pesticide residues can contaminate food and plants, leading to diseases in humans and animals that consume them. Furthermore, the continued use of pesticides poses a significant threat to the future of ecological life. These toxic chemical compounds have low biodegradation, and their metabolites persist in nature. It is important to note that the degradation of dichlorodiphenyltrichloroethane (DDT) in soil is esti-

mated to range from 4 to 30 years. On the other hand, it is known that other organochlorinated pesticides (OCPs) may remain stable for many years after their use (Afful et al., 2010).

In the study named "A Comparison of Organochlorine Pesticide Residues in Maternal Adipose Tissue, Maternal Blood, Cord Blood, and Human Milk from Mother/Infant Pairs" in 1992 by Laetitia W. Kanja and her team, OCPs analysis was performed in a total of 41 samples from mothers who had cesarean section operation. The samples found *p,p'*-DDT (100%), *p,p'*-DDE (100%), *o,p'*-DDT (59%), dieldrin (27%), transnonachlor (15%), *β*-HCH (12%) and lindane (2%), In contrast, polychlorobiphenyl (PCB) residues were not observed in any of the samples (Kanja et al., 1992).

According to research done in Northern Thailand on secondary students, 207 urinary samples were collected,14 metabolites were determined whereas 18 specific pesticide metabolites were also studied. The most observed metabolites were 2-[(dimethoxyphosphorothioyl)sulfanyl] succinic acid (malathion dicarboxylic acid), para-nitrophenol (PNP), 3,5,6-trichloro-2-pyridinol (TPCY; metabolite of chlorpyrifos), 2,4-dichlorophenoxyaceticacid (2,4-D), cis- and trans-3-(2,2-dichloro vinyl)-2,2-dimethyl cyclopropane- 1-carboxylic acids (c-DCCA and t-DCCA; metabolite of permethrin) and 3-phenoxybenzoicacid (3-PBA; metabolite of pyrethroids). The study categorized the students according to the parents' occupational groups. It was found that the urinary samples of students who's parents were farmers had the highest pyrethroid metabolite concentration. When grouped by gender, the male students recorded a higher value PNP i.e. Mann–Whitney test, $p = 0.009$ (Panuwet et al., 2009)

The study conducted in Türkiye analysed water and soil samples to investigate seasonal variations. The results showed that higher concentrations of OCPs are found during summer. The most observed pesticides in groundwater were endosulfan sulfate and 4,4'-DDT, whereas *alpha*-hexachlorocyclohexane (α-HCH) was the most abundant in surface waters. In addition, endosulfan sulfate was detected in soil samples. These findings demonstrate a clear understanding of the presence of OCPs in the environment and highlight the importance of continued research in this area (Karadeniz & Yenisoy- Karakaş, 2015).

Previous research has focused on the spatial distribution of OCPs throughout the Arctic Ocean in the region of the North Pole. The concentrations of heptachlor-*exo*-epoxide and α-HCH were observed to increase between the Chukchi Sea to the North Pole, while lower values were seen in Spitsbergen and the Greenland Sea. However, endosulfan had lower concentration in ice-covered regions (Jantunen & Bidleman, 1998).

1.2 Pesticide History in Türkiye

Agricultural control is defined as a practice aimed at protecting plants from diseases, pests, and weeds while enhancing yield and quality. This process should be carried out in accordance with the principles of integrated pest management, which utilise all available methods and prioritises those with minimal adverse effects on human health and the environment. Although various approaches exist in agricultural control, chemical control is the most commonly used. It is preferred due to its high effectiveness, rapid results, and cost-efficiency when applied responsibly. A further advantage of chemical control is its ability to protect crops from organisms that produce toxins (Delen et al., 2005).

Chemical control remains a pivotal element in contemporary plant protection practices. Nevertheless, the unregulated utilisation of pesticides can result in the emergence of resistance among harmful organisms and exert detrimental effects on human health and the environment through residues. In light of these concerns, pesticides are employed with greater awareness and in a regulated manner, particularly in developed countries.

The potential negative impacts of pesticides on the environment, public health, and the economy are well understood in developed countries. Consequently, agricultural products intended for human consumption are continuously monitored to ensure environmental and health safety. This is especially the case in the EU and other developed nations.

Analytical procedures for the detection of pesticide residues, which were initiated on a global scale during the 1950s, were first implemented in our nation in 1959. The inaugural practitioners of this analysis were Otacı and Güvener, who were employed at the Residue Laboratory of the Ankara Institute of Agricultural

Pesticides and Chemicals (Otacı & Güvener, 1959). As a result of ongoing research efforts, legislation has been enacted that mandates pesticide residue analysis.

As mentioned in the previous paragraphs, the use of pesticides has become an important issue for the environment and human health, for this reason, studies on the amount of pesticide use in our country were carried out and the data in Table 1.1 were obtained (T.R. Ministry of Agriculture and Forestry, 2025a). Pesticides, which are known to have a significant impact on both the environment and human health, have been prohibited or restricted in our country, Türkiye (T.R. Ministry of Agriculture and Forestry, 2025b) and in regions such as Europe (PAN, 2006) and America (EPA, 2024) with the focus of research in developed countries being a key factor in this decision. The detailed information is given in appendix 1.

Table 1.1. The usage amount of plant protection products (by grouping) by year in Türkiye (2006-2023) (T.R. Ministry of Agriculture and Forestry, 2025a).

	Plant Protection Product Types						
Years	**Total**	**Insecticide (Ton)**	**Fungicide (Ton)**	**Herbicide (Ton)**	**Acaricide (Ton)**	**Rodenticide + Molluscicide (Ton)**	***Others (Ton)**
2006	45.376	7.628	19.900	6.956	902	3	9.987
2007	48.716	21.046	16.707	6.669	966	51	3.277
2008	38.836	9.251	16.707	6.177	737	351	5.613
2009	37.651	9.914	17.863	5.961	1.533	78	2.302
2010	38.555	7.176	17.396	7.452	1.040	147	5.344
2011	39.534	6.120	17.546	7.407	1.062	421	6.978
2012	42.611	7.264	18.124	7.351	859	247	8.766
2013	39.440	7.741	16.248	7.336	858	129	7.128
2014	39.723	7.586	16.674	7.794	1.513	149	6.007
2015	39.026	8.117	15.984	7.825	1.576	197	5.327
2016	50.054	10.425	20.485	10.025	2.025	259	6.835
2017	54.098	11.436	22.006	11.759	2.452	236	6.209
2018	60.020	13.583	23.047	14.794	2.486	309	5.801
2019	51.297	11.609	19.698	12.644	2.124	264	4.958
2020	53.672	12.347	20.600	13.250	2.200	280	4.995
2021	52.965	11.071	19.098	13.320	2.342	283	6.851
2022	55.374	12.205	19.446	14.553	2.462	298	6.410
2023	57.766	12.326	19.614	15.509	3.104	297	6.916

* Plant Activator+Plant Growth Regulator+Insect Attractant+Fumigant+Nematicide

The significant role of agricultural products in countries' exports has necessitated the verification of their residue-free status. Consequently, by the late 1990s, quality control and quality assurance parameters, which indicate the reliability of pesticide residue analyses, became a key focus. The most important of these parameters include sample processing homogeneity, matrix effects, method validation, and measurement uncertainty assessments (Tiryaki, 2016).

1.3 Classification of Pesticides

The term pesticide is generally called for all family of insecticides, fungicides, wood preservatives, herbicides that are used to protect plants against unwanted pests. Pesticides can be produced from both synthetic and based plants (Figure 1.1).

The World Health Organization (WHO) defines insecticides as "chemical or biological substances used to kill or prevent unwanted or destructive behavior of insects." (WHO, 2019).

WHO classifies insecticides based on acute toxicity to assess the risks they pose to human health. This classification helps distinguish between less harmful insecticides and provides guidelines for pesticide formulation classification. (WHO, 2019).

The U.S. Environmental Protection Agency (EPA) utilizes a comprehensive classification system to assess the environmental and human health impacts of pesticides. The EPA's pesticide classification is based on factors such as toxicity, environmental effects, bioaccumulation, and hazard severity.

a) Classification Based on Toxicity

The EPA evaluates the toxic effects of pesticides by considering acute toxicity and chronic toxicity. Acute toxicity refers to the effects of pesticides from short-term exposure. The EPA uses the LD50 (Lethal Dose 50) measurement, which indicates how much of a substance is lethal. Pesticides are classified by the EPA as highly toxic, moderately toxic, or low toxicity based on their acute toxicity. Chronic toxicity, on the other hand, refers to the long-term effects of prolonged exposure, such as cancer risks or reproductive problems (EPA, 2022).

b) Environmental Effects and Bioaccumulation

The EPA also considers the environmental impact of pesticides, particularly the phenomenon of bioaccumulation, where pesticides accumulate in environmental organisms over time, potentially reaching toxic levels. Additionally, the impact of pesticides on water pollution is a key factor. The EPA makes regulations to prevent pesticides from damaging aquatic ecosystems and works to protect aquatic life (EPA, 2021).

c) Classification Based on Use

The EPA classifies pesticides based on their usage. For example, herbicides are used to control weeds, insecticides are used to kill insects, fungicides are used to prevent fungal diseases. Rodenticides are used to control rodents (EPA, 2022).

d) User Safety and Labeling

The EPA ensures that pesticide labels provide critical information to ensure user safety. These labels include details about the pesticide's toxicity level, environmental effects, legal use, and protective measures. The labels help users understand how to apply pesticides correctly and what personal protective equipment (PPE) is required (EPA, 2022).

e) Risk Assessment and Management

The EPA assesses the risks of pesticides by considering their potential impacts on the environment and human health. The agency creates regulations to ensure the safe use of pesticides and continuously monitors their effects. The risk assessment includes factors like toxicity, bioaccumulation, and environmental effects (EPA, 2021).

The synthetic pesticides are produced using organic and inorganic chemicals. These pesticides are identified according to the aim of usage. For this reason, they must be classified based on properties of chemical composition, mode of action and pesticide function. All these properties can easily be collected under a title based on their chemical composition and behaviours in nature.

Pesticides are separated into four main groups that are most analyzed in laboratories: organochlorines, organophosphates, carbamates, and pyrethroids (Kaur et al., 2019).

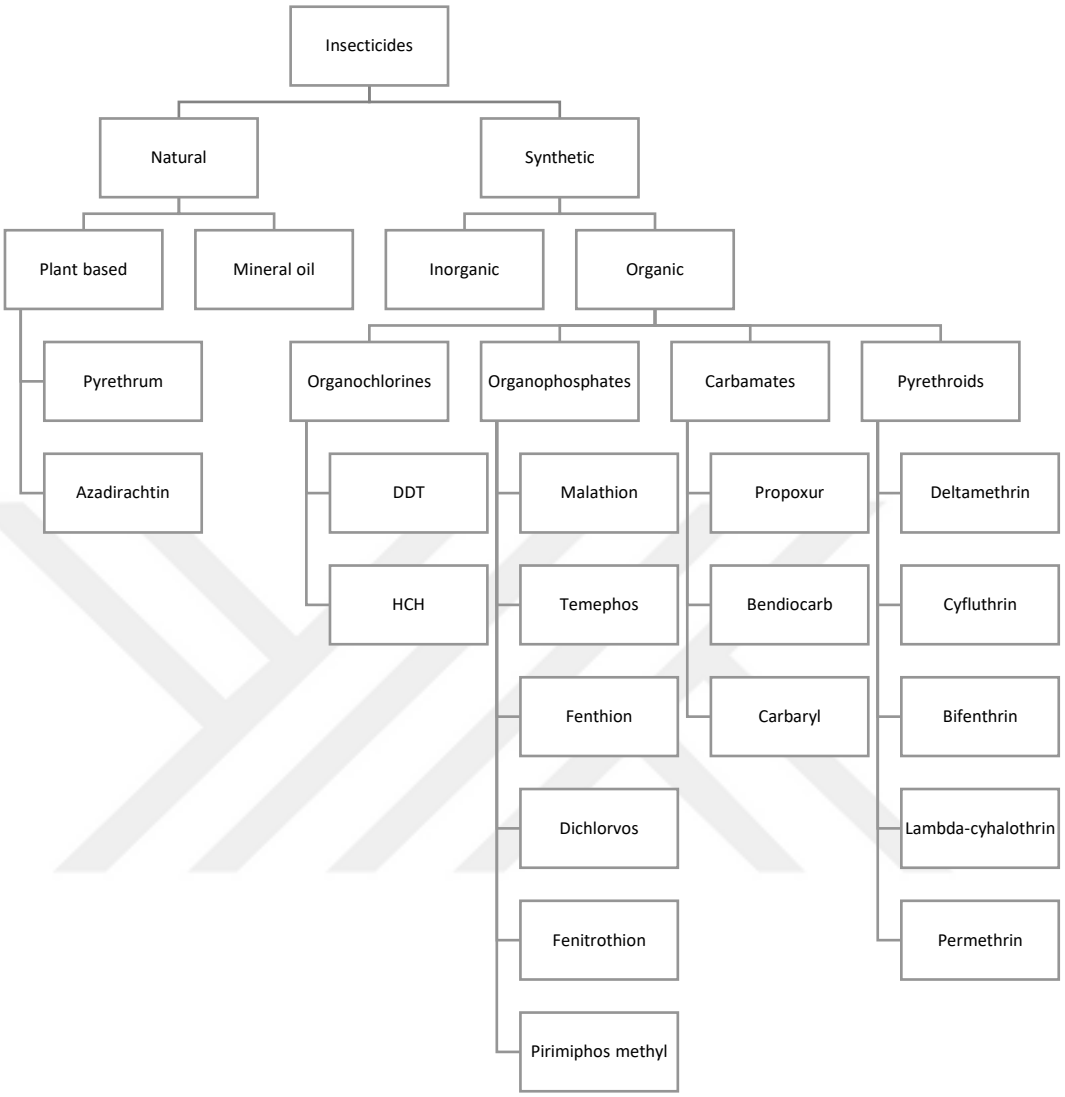


Figure 1.1 Classification of group of pesticides

1.3.1 Organochlorines Pesticides

Organochlorine pesticides (OCPs) are defined as organic compounds containing carbon, hydrogen, and chlorine atoms. Common examples include DDT, lindane, endosulfan, aldrin, dieldrin, heptachlor, toxaphene, and chlordane (Ababakar et al., 2020). These compounds exhibit high resistance to environmental degradation due to their high chlorine content and tend to accumulate in biological systems due to their lipophilic properties (Chandra et al., 2021). OCPs have been demonstrated to exert neurotoxic effects on the central nervous system, potentially causing convulsions and neurological damage. In addition to their neurotoxicity,

OCPs have been shown to possess endocrine-disrupting properties, which can lead to adverse effects on hormonal systems, including reproductive and developmental disorders. For instance, some OCPs, such as dieldrin, have been associated with health concerns, including Parkinson's disease and immune system impairment (Martyniuk et al., 2020).

1.3.2 Organophosphorous Pesticides

Organophosphates (OPs) are defined as chemical compounds that form bonds between a phosphorus atom and one or more alkyl, aryl, or other organic groups. In their chemical structure, the phosphorus atom typically bonded to oxygen atoms to form ester groups. This structural characteristic enables organophosphate compounds to inhibit the activity of the enzyme acetylcholinesterase (AChE), thereby leading to the neurotoxic effects observed in vivo. The inherent properties of organophosphates, such as their low volatility and ability to persist in the environment, pose a significant threat to human health. Organophosphates exhibit resistance to environmental degradation, a property that allows them to persist in the surrounding water and soil for extended periods. These compounds are rapidly metabolized in the body, producing toxic metabolites that can accumulate in both organic and inorganic forms. The chemical properties of organophosphates make them highly effective pesticides, yet they also present a considerable risk to human health (Jokanovic, 2018).

1.3.3 Carbamates

Carbamate pesticides represent a class of chemical compounds derived from carbamic acid, featuring the carbamate group (-NHCOO-) which consists of a carbonyl group bonded to an amine and alcohol group (Chaturvedi, 2012). These compounds are distinguished by their stability, low volatility, and water solubility, properties that contribute to their environmental persistence and potential for bioaccumulation (WHO, 1986). These pesticides inhibit acetylcholinesterase (AChE), leading to the accumulation of acetylcholine and subsequent overstimulation of neurons, resulting in toxic effects. In contrast to organophosphates, carbamates bind reversibly to AChE, allowing for enzyme regeneration over time (Silberman & Taylor, 2023). Carbamates are highly toxic to humans and wildlife, causing symptoms such as headaches and dizziness, with severe cases resulting in respiratory failure.

Notable carbamates include aldicarb, carbaryl, methomyl, and carbofuran. Their toxicity has led to regulatory measures in numerous countries (Silberman & Taylor, 2023).

1.3.4 Pyrethroids

Pyrethroids, a class of synthetic insecticides, are derived from natural pyrethrins found in chrysanthemum flowers. These compounds are distinguished by an ester bond that links an acid group with an alcohol group, a structural feature that is crucial for their insecticidal efficacy. Pyrethroids possess a high degree of lipophilicity, exhibit low water solubility, and demonstrate environmental persistence (Casida & Quistad, 1998).

These compounds are believed to act by interacting with voltage-dependent sodium channels present in the nerve cells of the insect, thus impeding the transmission of nerve impulses and ultimately leading to the paralysis and death of the insect (US Environmental Protection Agency, 2017). While pyrethroids are generally recognized as having lower toxicity levels when compared to other insecticide compounds, concerns have been raised regarding their potential harm to aquatic environments and the possibility of causing ecological concerns due to their persistence (European Food Safety Authority, 2022).

1.4 Reference Material

In order to accurately monitor pesticides throughout various environments, it is essential to utilize reliably produced reference materials (RM). These ensure results are true to the samples taken and allow proper actions and policy measures to be taken (IAEA, 2003).

In 2005, the Reference Materials Committee of the International Organisation for Standardisation (REMCO) alongside the International Standardisation Organisation (ISO) published the following new definitions:

Reference material: A material that is sufficiently homogeneous and stable with respect to one or more specified properties and has been established to be suitable for its intended use in a measurement process (Emons et al., 2006; Popescu et al., 2002).

Certified reference material: A reference material is characterised by a metrologically valid procedure for one or more specified properties. This must be accompanied by a certificate stating the value of the specified property. its associated uncertainty, and a statement of metrological traceability (Emons et al., 2006; Popescu et al., 2002).

1.5 The Aim and Scope of Study

The reason pesticides were selected as the analyte in this study is that the existing reference materials are imported from other countries, and this costs a lot of money. Furthermore, the reference materials available do not contain the desired compositions. As a result, laboratories in Türkiye are attempting to prepare their own mixtures, which negatively impacts the reliability of the analysis. On the other hand, pesticides are mandatory analyses in Türkiye. Food and environmental laboratories are required to keep pesticide residues within specified limit values for the protection of public and environmental health. For these reasons, pesticides were chosen as the analyte for the reference material mixture.

This study aims to demonstrate the feasibility of domestic production, at laboratory scale, of a pesticide reference material within Türkiye. This will be done through gravimetric preparation of a pesticide reference material mixture. This work aims to ensure that an accurate and reliable pesticide reference material is available for use within environmental and manufacturing settings.

In order to achieve the objective, a reference material mixture of totally 108 pesticides was meticulously prepared using the gravimetric method. Homogeneity. short- and long-term stability, characterisation, experiments and uncertainty calculations were carried out for 14 pesticides present in the mixture using ISO Guide 30, ISO Guide 31, ISO Guide 33, ISO Guide 17034 and ISO Guide 35. The subsequent aim was to carry out the studies required for the certification phase of the study.

2. MATERIALS and METHOD

The materials were prepared in a clean room dedicated to the production of reference material mixtures, with a particular emphasis on the monitoring of environmental. health. and safety-related factors.

2.1 Chemicals

The study purchased all solid and liquid reference materials from reputable companies such as LGC Group Company (England), TRC (Canada), Chem Service (USA), CPA Chem (Bulgaria), and Sigma Aldrich (Germany) (Table 2.1). The solvents used in preparing solutions, subgroups, and mixtures, namely methanol (ME), cyclohexane (CY), acetonitrile (AL), and acetone (AC), were obtained from MERCK (Israel) and had a high purity level of 99.9%. In addition, the calibration standard (Organochlorine Pesticide mix 3 YA06170100TH / Dr. Ehrenstorfer GmbH) was purchased from LGC Group Company.

2.2 Preparation of Pesticide Solutions

A total of 108 pesticides, which can be analysed by GC MS, have been reliably prepared as solutions by gravimetric and volumetric method, with different concentrations and solvents, based on their solubility characteristics for mixture I and mixture II (Table 2.2 and Table 2.3). The concentrations of individual solutions were calculated according to the amount of sample.

Table 2.1. Some manufacture information of pure substances

No	Name of Compound	CAS No	Product Code
1	4,4'-DDT	50-29-3	DRE-C12082000
2	2,4'-DDD	53-19-0	TRC-M372500
3	2,4'-DDE	3424-82-6	SB354.50
4	2,4'-DDT	789-02-6	N-12708-50MG
5	2-Phenylphenol (Ortho phenylphenol)	90-43-7	DRE-C16070000
6	4,4'-DDD (4,4-TDE)	72-54-8	N-10874-250MG
7	4,4'-DDE	72-55-9	N-10875-100MG
8	acetochlor (chloroacetamide)	34256-82-1	TRC-A162500
9	aclonifen	74070-46-5	DRE-C10042000
10	aldrin (HHDN)	309-00-2	N-11049-250MG
11	azinphos-ethyl	2642-71-9	DRE-C10360000
12	benalaxyl	71626-11-4	N-11133-250MG
13	benfluralin	1861-40-1	N-11136-250MG
14	bifenazate	149877-41-8	TRC-B383020
15	bifenthrin	82657-04-3	DRE-C10584000
16	biphenyl	92-52-4	SB93.1000
17	bitertanol (biloxazol) (mixture of izomers and diastomers)	55179-31-2	DRE-C10660000
18	bromophos-ethyl	4824-78-6	DRE-C10740000

Table 2.1 (continued). Some manufacture information of pure substances

No	Name of Compound	CAS No	Product Code
19	bromopropylate	18181-80-1	DRE-C10762000
20	captan	133-06-2	N-11400-250MG
21	carbosulfan	55285-14-8	DRE-C11030000
22	carfentrazone-ethyl	128639-02-1	TRC-C183455
23	chlordecone (kepone)	143-50-0	DRE-C11220000
24	chlorfenapyr	122453-73-0	TRC-C428500
25	chlorfenvinphos	470-90-6	DRE-C11290000
26	chlorothalonil	1897-45-6	DRE-C11510000
27	chlorpyrifos-methyl	5598-13-0	N-11460-250MG
28	chlorthal-dimethyl (DCPA, TCTP, Dacthal)	1861-32-1	SB3030.250
29	cycloate	1134-23-2	DRE-C11820000
30	cyfluthrin (mixture of isomers)	68359-37-5	DRE-C11850000
31	cyhalofop-butyl	122008-85-9	TRC-C989385
32	cyhalothrin-lambda	91465-08-6	SB226.100
33	diazinon	333-41-5	N-11621-250MG
34	dichloran (dcna; ditranil)	99-30-9	N-11678-250MG
35	diclofop-methyl	51338-27-3	DRE-C12540000
36	dicofol (kelthane)	115-32-2	DRE-C12570000
37	dieldrin	60-57-1	N-11688-100MG
38	diflufenican	83164-33-4	TRC-D445640

Table 2.1 (continued). Some manufacture information of pure substances

No	Name of Compound	CAS No	Product Code
39	dimethachlor	50563-36-5	DRE-C12670000
40	diphenamid	957-51-7	DRE-C12880000
41	diphenylamine (dpa)	122-39-4	DRE-C12890000
42	endosulfan sulfate	1031-07-8	DRE-C13133000
43	*alpha*-endosulfan	959-98-8	N-10979-100MG
44	*beta*-endosulfan	33213-65-9	DRE-C13122000
45	endrin	72-20-8	N-11854-100MG
46	epn	2104-64-5	N-11858-250MG
47	esfenveralate	66230-04-4	DRE-C13211000
48	ethalfluralin	55283-68-6	N-11865-250MG
49	ethoprophos (prophos)	13194-48-4	N-13110-100MG
50	ethoxyquin	91-53-2	SB5460.250
51	etridiazole (ethazol)	2593-15-9	DRE-C13370000
52	fenamiphos	22224-92-6	N-12854-250MG
53	fenvalerate	51630-58-1	DRE-C13630000
54	fipronil	120068-37-3	TRC-F342200
55	flucythrinate	70124-77-5	N-11984-100MG
56	flurochloridone	61213-25-0	TRC-F599033
57	flutolanil	66332-96-5	DRE-C13863500
58	fluvalinate (tau-fluvalinate)	102851-06-9	N-13263-100MG

Table 2.1 (continued). Some manufacture information of pure substances

No	Name of Compound	CAS No	Product Code
59	folpet	133-07-3	DRE-C13890000
60	HCH-*alpha* (*Alpha* BHC)	319-84-6	N-11194-100MG
61	HCH-*beta* (Beta BHC)	319-85-7	DRE-C14072000
62	HCH-*gamma* (Lindane. Gamma BHC)	58-89-9	DRE-C14073000
63	heptachlor	76-44-8	N-12147-100MG
64	heptachlor-endo-epoxide (Isomer A) (Trans-heptachloroepoxide)	28044-83-9	N-13618-50MG
65	heptachlor Exoepoxide (Isomer B) (Cis-heptachloroepoxide)	1024-57-3	N-12148-50MG
66	hexachlorobenzene (HCB)	118-74-1	N-12159-250MG
67	iprodione	36734-19-7	TRC-I745000
68	isofenphos	25311-71-1	DRE-C14420000
69	metalaxyl	57837-19-1	TRC-M258740
70	metazachlor	67129-08-2	DRE-C14950000
71	methidathion	950-37-8	N-12397-250MG
72	methoxychlor	72-43-5	DRE-C15060000
73	metrafenone	220899-03-6	DRE-C15190000
74	mevinphos	7786-34-7	DRE-C15220000
75	mirex	2385-85-5	DRE-C15270000
76	nitrofen	1836-75-5	SB403.100
77	oxadiazon	19666-30-9	TRC-O758510
78	oxyfluorfen	42874-03-3	DRE-C15800000

Table 2.1 (continued). Some manufacture information of pure substances

No	Name of Compound	CAS No	Product Code
79	parathion-methyl	298-00-0	DRE-C15890000
80	phorate	298-02-2	DRE-C16080000
81	pirimiphos-methyl	29232-93-7	DRE-C16270000
82	procymidone	32809-16-8	DRE-C16310000
83	profenofos	41198-08-7	DRE-C16330000
84	prothiofos	34643-46-4	DRE-C16560000
85	pyraflufen-ethyl	129630-19-9	DRE-C16597000
86	pyrazophos	13457-18-6	DRE-C16610000
87	quinalphos	13593-03-8	DRE-C16700000
88	quinoxyfen	124495-18-7	TRC-Q765500
89	quintozene (pentachloronitrobenzene. PCNB)	82-68-8	SB544.250
90	spiromesifen	283594-90-1	N-13224-100MG
91	tecnazene	117-18-0	SB6240.250
92	tefluthrin	79538-32-2	TRC-T013800
93	terbuthylazine	5915-41-3	DRE-C17300000
94	tetradifon	116-29-0	DRE-C17400000
95	tetramethrin	7696-12-0	DRE-C17410000
96	thiometon	640-15-3	31681-250MG
97	tolclofos-methyl	57018-04-9	DRE-C17590000
98	tolylfluanid	731-27-1	DRE-C17600000

Table 2.1 (continued). Some manufacture information of pure substances

No	Name of Compound	CAS No	Product Code
99	trifluralin	1582-09-8	TRC-T793550
100	vinclozolin	50471-44-8	DRE-C17920000
101	chlorfenprop (chlorfenprop-methyl)	14437-17-3	DRE-C11260000
102	cypermethrin-*alpha* (alphamethrin)	67375-30-8	TRC-C989005
103	dimethipin	55290-64-7	DRE-C12680000
104	dinobuton (dinofen)	973-21-7	DRE-C12790000
105	isocarbophos	24353-61-5	DRE-C14402000
106	metolachlor	51218-45-2	DRE-C15170000
107	pirimiphos-ethyl	23505-41-1	N-13063-250MG
108	tetrasul	2227-13-6	DRE-C17420000

2.3 Preparation of Subgroups

The 16 subgroups (in acetone) were meticulously prepared gravimetrically and volumetrically, taking into account the concentration of individual solutions for mix A, mix B and mix C, as given in Table 2.3. These subgroups were identified according to concentration of individual solutions. The solutions that have the lower concentrations were collected in the subgroup 1, subgroup 2, subgroup 3 and subgroup 16.

2.4 Preparation of Mixtures

Due to concentrations of subgroups the mixtures were divided into two groups as mixture 1 and mixture 2 under the main mixture of A, mixture B and mixture C. Mixture I contains 1^{st}, 2^{nd}, 3^{rd}, and 16^{th} subgroups, while mixture II contains the remaining 14 subgroups. The mixtures (A and B) were prepared at a concentration of 100 ppm in acetonitrile using gravimetric method and likewise the mixture C was prepared at a concentration of 80 ppm in acetonitrile using volumetric method. Further information is given in Table 2.4.

2.5 Mixture Treatment and Naming

Two primary mixtures (mixture I and mixture II) were methodically prepared by gravimetric and volumetric method. The initial preparation, designated as mix A, encompasses both mixture I and mixture II. Furthermore, mix II from mix A was meticulously divided into two separate bottles (hereafter referred to as the first bottle and the second bottle, respectively) to ensure the comprehensive execution of all studies at temperatures of -20°C, 20°C, and +4°C. Subsequently, mix B was methodically prepared for mixture I and mixture II to verify the efficacy of mix A. These were characterised, stabilised, calibrated and purified at -20°C, 20°C and +4°C. Thirdly, mix C was prepared by volumetric technique to demonstrate that gravimetric method is the primary method. It was studied at -20°C for uncertainty

in characterisation, stability, calibration and purity studies. The studies were illustrated in Figure 2.1, 2.2 and 2.3.

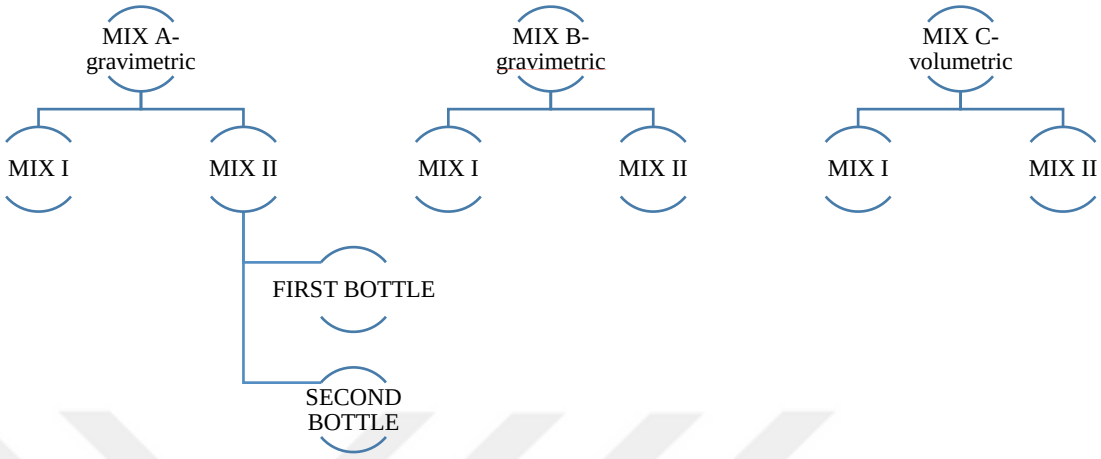


Figure 2.1. Studied mixtures at -20°C for all studies

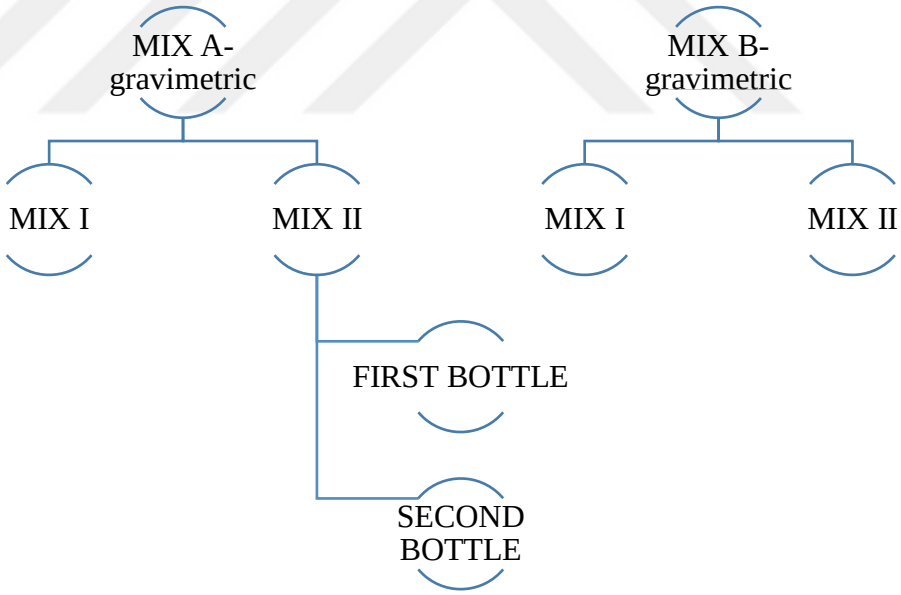


Figure 2.2. Studied mixtures at +4°C

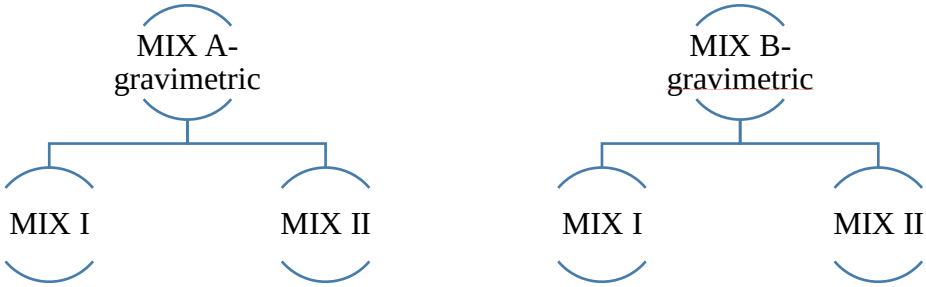


Figure 2.3. Studied mixtures at 20°C

Table 2.2. Preparation of individual solutions by gravimetric method

Nu	Name of sample	Concentration (ppm)	Amount of sample (mg)	Solvent (mg)	Suggested solvent	Used Solvent in our preperation	Used Solvent in our preperation
1	acetochlor (chloroacetamide)	7444.2	164.5	22096.5	ME	ME	
2	chlorfenvinphos	6951.3	168.2	24198.2	AL	AL	
3	cycloate	8000.0	205.4	25673.0	AL	AL	
4	cyfluthrin (mixture of isomers)	8821.9	200.7	22744.7	AC	AC	
5	diazinon	9200.0	229.2	24908.0	Toluene,CY	CY	
6	diphenamid	1996.0	2.5	1267.5	CY	AL	AL
7	ethoprophos (prophos)	10000.0	287.2	28718.0	AL	AL	
8	ethoxyquin	7936.5	211.8	26680.6	AL	AL	
9	etridiazole (ethazol)	8000.0	204.9	25935.0	CY	CY	
10	flucythrinate	9900.0	258.1	23684.4	AL	AL	
11	fluvalinate (tau-fluvalinate)	10000.0	407.3	40730.0	AL	AL	
12	hexachlorobenzene (HCB)	2671.3	11.8	4424.8	Methanol	CY	
13	ıprodione	1996.0	5.8	2890.8	DMSO (Slightly). Methanol (Slightly)	ME	AL
14	ısofenphos	7500.0	203.1	27077.0	CY	CY	
15	mevinphos	8000.0	206.5	25816.0	AL	AL	
16	mirex	1996.0	7.1	3557.1	AC	ME	
17	phorate	8428.4	84.7	10044.7	ME	ME	
18	pirimiphos-methyl	8919.7	224.3	25144.3	AC	AC	
19	prothiofos	7500.0	207.6	27680.0	AL	AL	
20	thiometon	7444.3	236.1	31718.1	Toluene;CY	CY	
21	chlorfenprop (chlorfenprop-methyl)	6941.2	68.1	9816.7	CY	CY	

Table 2.2 (continued). Preparation of individual solutions by gravimetric method

Nu	Name of sample	Concentration (ppm)	Amount of sample (mg)	Solvent (mg)	Suggested solvent	Used Solvent in our preperation	Used Solvent in our preperation
22	metolachlor	8500.0	231.3	27205.0	AL	AL	
23	pirimiphos-ethyl	7641.2	207.3	27129.3	Toluene;CY	CY	
24	tetrasul	2991.0	10.2	3400.2	AC	ME	
25	4,4'-DDT	17681.7	41.2	2329.0	CY	AL	
26	2,4'-DDD	19607.8	30.7	1566.7	DMSO (Slightly). Methanol (Slightly)	AL	
27	2,4'-DDE	10880.3	17.2	1578.1	AC	AL	
28	2,4'-DDT	12833.2	16.7	1297.4	ME	AL	
29	2-Phenylphenol (Ortho phenylphenol)	11857.7	14.4	1213.6	AC	ME	
30	4,4'-DDD (4,4-TDE)	9410.6	11.2	1188.0	AL	AL	
31	4,4'-DDE	9901.0	20.6	2082.6	ME	AL	
32	aclonifen	14778.3	19.4	1312.1	AL	AL	
33	aldrin (HHDN)	11857.7	20.7	1746.5	ME	AL	
34	azinphos-ethyl	11857.7	15.1	1270.9	AL	AL	
35	benalaxyl	11857.7	13.5	1134.3	ME	ME	
36	benfluralin	17681.7	21.1	1193.9	AL	AL	
37	bifenazate	6951.3	15.6	2249.9	ME	ME	
38	bifenthrin	7936.5	9.3	1173.1	AL	AL	
39	biphenyl	29126.2	42.8	1469.5	AC	AL	
40	bitertanol (biloxazol) (mixture of izomers and diastomers)	7936.5	10.7	1345.7	AL	AL	
41	bromophos-ethyl	7914.2	75.3	9513.3	CY	AL	
42	bromopropylate	6951.3	10.6	1517.7	CY	AL	

Table 2.2 (continued). Preparation of individual solutions by gravimetric method

Nu	Name of sample	Concentration (ppm)	Amount of sample (mg)	Solvent (mg)	Suggested solvent	Used Solvent in our prepe-ration	Used Sol-vent in our pre-peration
43	captan	9901.0	22.7	2295.7	TO	AL	
44	carbosulfan	8428.4	167.8	19905.4	CY	AL	
45	carfentrazone-ethyl	35000.0	125	3571.4	ME	ME	
46	chlordecone (kepone)	16715.8	23.1	1380.7	CY	AL	
47	chlorfenapyr	24390.2	40.2	1647.4	Chloroform (Sparingly). Methanol (Slightly)	AL	
48	chlorothalonil	7936.5	10.6	1338.1	AL	AL	
49	chlorpyrifos-methyl	11857.7	15.7	1326.6	AL	AL	
50	chlorthal-dimethyl (DCPA, TCTP, DACT-HAL)	4975.1	6.3	1266.3	AC	ME	
51	cyhalofop-butyl	18645.7	30.9	1658.8	DMSO (Slightly). Methanol (Slightly)	AL	
52	cyhalothrin-lambda	24390.2	30.2	1237.8	AC	AL	
53	dichloran (DCNA; ditranil)	12345.7	21.4	1731.0	AL	AL	
54	diclofop-methyl	11857.7	15.3	1288.6	CY	AL	
55	dicofol (kelthane)	10880.3	16.2	1487.1	CY	AL	
56	dieldrin	17681.7	35.2	1987.9	ME	AL	
57	diflufenican	9901.0	24.6	2485.6	Acetone (Slightly). Chloroform (Slightly). DMSO (Slig-htly). Ethanol (Slightly)	AL	
58	dimethachlor	14778.3	50.1	3387.4	AL	AL	
59	diphenylamine (DPA)	13806.7	18.6	1347.2	AL	AL	
60	endosulfan sulfate	14778.3	22.8	1541.4	CY	AL	
61	*alpha*-endosulfan	19607.8	31.0	1582.0	AL	AL	
62	*beta*-endosulfan	16715.8	26.3	1572.8	AL	AL	
63	endrin	14778.3	31.0	2099.7	ME	AL	

Table 2.2 (continued). Preparation of individual solutions by gravimetric method

Nu	Name of sample	Concentration (ppm)	Amount of sample (mg)	Solvent (mg)	Suggested solvent	Used Solvent in our prepe-ration	Used Sol-vent in our pre-peration
64	EPN	16715.8	20.2	1209.6	AL	AL	
65	esfenveralate	17681.7	22.4	1267.4	CY	AL	
66	ethalfluralin	16715.8	23.2	1385.5	AL	AL	
67	fenamiphos	16715.8	20.8	1243.7	AL	AL	
68	fenvalerate	6951.3	10.9	1566.6	AL	AL	
69	fipronil	24390.2	46.0	1884.4	DMSO (Slightly). Methanol (Very Slightly)	AL	
70	flurochloridone	19607.8	30.2	1542.2	DMSO (Slightly). Methanol (Slightly)	AL	
71	flutolanil	9901.0	15.1	1523.1	CY	AL	
72	folpet	5964.2	9.5	1587.8	CY	AL	
73	HCH-*alpha* (*Alpha* BHC)	17681.7	39.3	2219.8	TO	AL	
74	HCH-*beta* (*Beta* BHC)	9901.0	20.4	2055.4	AC	AL	
75	HCH-gamma (Lindane. Gamma BHC)	10880.3	14.2	1307.9	TO	AL	
76	heptachlor	17681.7	27.7	1566.0	ME	AL	
77	heptachlor-endo-epoxide (Isomer A) (Trans-heptachloroepoxide)	7936.5	15.1	1903.9	ME	ME	
78	heptachlor Exoepoxide (Isomer B) (Cis-hep-tachloroepoxide)	14778.3	22.3	1510.3	ME	AL	
79	metalaxyl	33816.4	53.1	1569.1	Chloroform (Slightly). Methanol (Slightly)	ME	AL
80	metazachlor	11857.7	14.7	1243.1	AL	AL	
81	methidathion	33816.4	45.2	1335.7	AL	AL	
82	methoxychlor	10880.3	14.4	1326.2	IO	AL	
83	metrafenone	9410.6	11.3	1196.5	AL	AL	
84	nitrofen	5964.2	7.2	1200.5	AC	ME	

Table 2.2 (continued). Preparation of individual solutions by gravimetric method

Nu	Name of sample	Concentration (ppm)	Amount of sample (mg)	Solvent (mg)	Suggested solvent	Used Solvent in our prepe-ration	Used Sol-vent in our pre-peration
85	oxadiazon	17681.7	22.5	1271.9	Chloroform (Slightly). Ethyl Acetate (Slightly)	AL	
86	oxyfluorfen	9901.0	14.6	1472.6	AL	AL	
87	parathion-methyl	11857.7	16.8	1414.3	CY	AL	
88	procymidone	7936.5	10.5	1325.5	IO	AL	
89	profenofos	8000.0	208.1	26012.5	CY	CY	
90	pyraflufen-ethyl	16715.8	25.1	1499.2	CY	AL	
91	pyrazophos	11857.7	16.2	1365.4	IO	AL	
92	quinalphos	14778.3	23.1	1563.8	AC	AL	
93	quinoxyfen	11857.7	18.5	1561.0	Chloroform (Slightly). Methanol (Slightly)	AL	
94	quintozene (Pentachloronitrobenzene. PCNB)	6951.3	14.6	2097.4	AC	ME	
95	spiromesifen	17681.7	31.0	1754.4	AL	AL	
96	tecnazene	9410.6	12.1	1280.5	AC	AL	
97	tefluthrin	4937.0	33.5	6793.5	Chloroform (Slightly). DMSO (Slightly). Methanol (Slig-htly)	ME	AC
98	terbuthylazine	9901.0	17.9	1808.9	AC	AL	
99	tetradifon	7936.5	12.6	1581.3	CY	AL	
100	tetramethrin	9901.0	14.3	1444.3	CY	AL	
101	tolclofos-methyl	11857.7	18.6	1570.3	CY	AL	
102	tolylfluanid	12833.2	16.0	1249.9	CY	AL	
103	trifluralin	19607.8	35.9	1832.4	Chloroform (Slightly). Methanol (Slightly)	AL	
104	vinclozolin	7936.5	1.2	147.4	CY	AL	

Table 2.2 (continued). Preparation of individual solutions by gravimetric method

Nu	Name of sample	Concentration (ppm)	Amount of sample (mg)	Solvent (mg)	Suggested solvent	Used Solvent in our prepe-ration	Used Sol-vent in our pre-peration
105	cypermethrin-*alpha* (alphamethrin)	19607.8	30.9	1573.9	Chloroform (Slightly). Methanol (Slightly)	AL	
106	dimethipin	15748.0	23.8	1511.3	AL	AL	
107	dinobuton (dinofen)	14778.3	21.5	1454.8	AL	AL	
108	ısocarbophos	8919.7	10.7	1194.0	CY	AL	

Table 2.3. Subgroup contents for gravimetric and volumetric mixtures

subgroup 1	subgroup 2	subgroup 3	subgroup 4	subgroup 5	subgroup 6
ethoxyquin	ethoprophos (pro-phos)	prothiofos	tolclofos-methyl	fenvalerate	methidathion
cycloate	metolachlor	chlorfenvinphos	bifenthrin	heptachlor-endo-epox-ide (isomer a) (trans-heptachloroepoxide)	bifenazate
pirimiphos-ethyl	mevinphos	fluvalinate (tau-fluvalinate)	bromophos-ethyl	pyrazophos	quintozene (pentachloroni-trobenzene. pcnb)
thiometon	isofenphos	flucythrinate	carbosulfan	chlorothalonil	chlorpyrifos-methyl
phorate	diazinon	etridiazole (etha-zol)	tecnazene	oxyfluorfen	
acetochlor (chloroa-cetamide)	cyfluthrin (mixture of isomers)	chlorfenprop (chlorfenprop-methyl)	fipronil		
pirimiphos-methyl			metrafenone		
			metalaxyl		
			procymidone		

Table 2.3. (continued). Subgroup contents for gravimetric and volumetric mixtures

subgroup 7	subgroup 8	subgroup 9	subgroup 10	subgroup 11	subgroup 12
chlorthal-dimethyl (DCPA, TCTP, Dacthal)	bromopropylate	flutolanil	4,4-DDE	HCH-gamma (Lindane, Gamma BHC)	metazachlor
nitrofen	tetramethrin	carfentrazone-ethyl	4,4’-DDD (4,4-TDE)	dicofol (kelthane)	benalaxyl
biphenyl	tefluthrin	isocarbophos	Diflufenican	alpha-endosulfan	heptachlor
endrin	dinobuton (dinofen)	epn	HCH-beta (Beta BHC)	cypermethrin-alpha (alphamethrin)	benfluralin
aldrin (HHDN)	parathion-methyl	terbuthylazine	2,4-DDD	cyhalofop-butyl	tetradifon
		chlorfenapyr	cyhalothrin-lambda	trifluralin	spiromesifen
			methoxychlor	vinclozolin	quinoxyfen
			2,4-DDE	2-Phenylphenol (Ortho phenylphenol)	azinphos-ethyl
			flurochloridone	oxadiazon	esfenveralate
				bitertanol (biloxazol) (mixture of izomers and diastomers)	4,4’-DDT

Table 2.3. (continued). Subgroup contents for gravimetric and volumetric mixtures

subgroup 13	subgroup 14	subgroup 15	subgroup 16
diclofop-methyl	folpet	2,4'-DDT	diphenamid
ethalfluralin	heptachlor exoepoxide (isomer b) (cis-heptachloroepoxide)	tolylfluanid	mirex
HCH-alpha (Alpha BHC)	quinalphos	diphenylamine (DPA)	Hexachlorobenzene (HCB)
dichloran (DCNA; Ditranil)	dimethipin	aclonifen	tetrasul
beta-endosulfan	pyraflufen-ethyl	dimethachlor	iprodione
chlordecone (kepone)	fenamiphos	dieldrin	
profenofos	captan	endosulfan sulfate	

Table 2.4. Contents of mixture I and mixture II

mix I	**mix II**
subgroup 1	subgroup 4
subgroup 2	subgroup 5
subgroup 3	subgroup 6
subgroup 16	subgroup 7
	subgroup 8
	subgroup 9
	subgroup 10
	subgroup 11
	subgroup 12
	subgroup 13
	subgroup 14
	subgroup 15

2.6 Analysis Method

The calibration standards were prepared gravimetrically and volumetrically as 5 standards. The prepared mixtures were diluted to a concentration of 2 ppm for analysis by GC-MS (Schimadzu, GCMS-QP2010). The GC was equipped with a HP-5MS (30.0 m x 0.25 um x 0.25 mm ID; Agilent) column. Helium was used as a mobile phase at 1 mL min^{-1} constant flow. The oven temperature was programmed as 70°C for 2 min; 160°C min^{-1} to 200°C; 250°C min^{-1} to 280°C, with a 4 min final hold. The injection volume was 1.0 μL and in the splitless mode. Further information is given in Table 2.5.

The mix A and mix B prepared gravimetrically and the mix C prepared volumetrically were analysed by GC-MS and 14 pesticides were detected, namely hexachlorobenzene (HCB), metolachlor, *alpha*-hexachlorocyclohexane (α-HCH), gamma-hexachlorocyclohexane (γ-HCH), aldrin, dieldrin, endosulfan-*alpha*, endosulfan-beta, 1,1'-(trichloroethane-diyl) bis(4-chlorobenzene), endrin, endosulfan-*beta*, 1,1'-(2,2,2-trichloroethane-1,1-diyl)bis(4-chlorobenzene) (4,4'-DDT), 4,4'-dichlorodiphenyldichloroethane (4,4'-DDD), 2,4'-dichlorodiphenyltrichloroethane (2,4'-DDT), heptachlor and, heptachlor endo-epoxide (not applicable in mix C).



Photo 2.1. A photo of Gas Chromatography Mass Spectrometry system in laboratory

Table 2.5. Operation parameters of Gas Chromatography Mass Spectrometry

GC									
		Program: Column Oven Temperature				**Column:**			
				Final Temperature					
Column Oven Temperature	70°C		Rate	(°C)	Hold Time (min)	Name	HP 5 MS	Thickness	0.25 µm
Injection Temperature	240°C	0	-	70.0	2	Length	30 m	Diameter	0.25 mm
Injection Mode	Splitless	1	15	160.0	0				
Sampling Time	1.00 min	2	2	200.0	0				
Carrier Gas	Helium	3	10	250.0	0				
Flow Control Mode	Linear Velocity	4	20	280.0	4				
Column Flow	1.00 mL/min								
Linear Velocity	36.7 cm/sec								
Purge Flow	3.0 mL/min								
MS									
Ion Source Temperature	230°C								
Interface Temperature	280°C								
Solvent Cut Time	6 min								

2.7 Fish Bone Diagram

The fish bone diagram (also known as cause-and-effect diagram or Ishikawa diagram) assists in ensuring that each source of uncertainty is only accounted for once in the budget. This makes it easier to determine which contributions are most critical and which have minimal impact (Yenisoy-Karakaş, 2006).

A fish bone diagram was utilized to determine the uncertainty of each pesticide gravimetrically and volumetrically. The uncertainty was determined by considering homogeneity. stability, characterization, purity, and calibration curve for the gravimetric preparation. Similarly, the uncertainty was determined by considering characterization, purity, stability, and calibration curve for volumetric preparation. Characterization involved preparing individual solutions, subgroups, mixtures, and dilutions for instrumental analysis. It is important to consider the effects of weighing the solid standard pesticide and solvent, as well as calibration of the balance (tare and weighing) and pipette, when preparing the individual solution and mixtures. Furthermore, temperature is a critical factor in stability studies, as evidenced by the findings of this study, which were conducted at 20°C, +4°C in mixes A and B, and at -20°C in mixes A, B and C. It is important to ensure that homogeneity testing is not overlooked, and that the purity of solid standards is maintained when preparing mixtures.

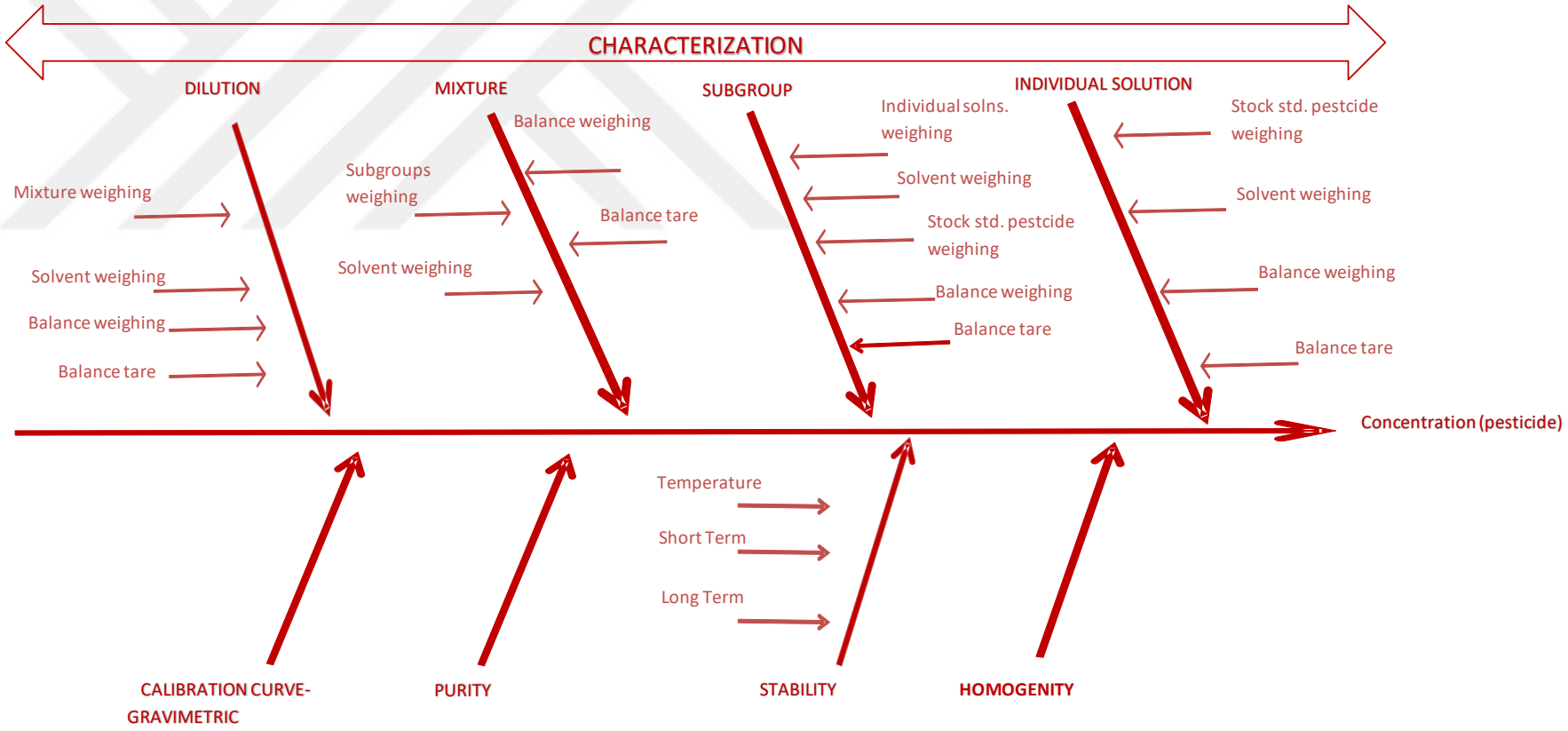


Figure 2.4. Fish bone diagram of preparing CRM gravimetrically

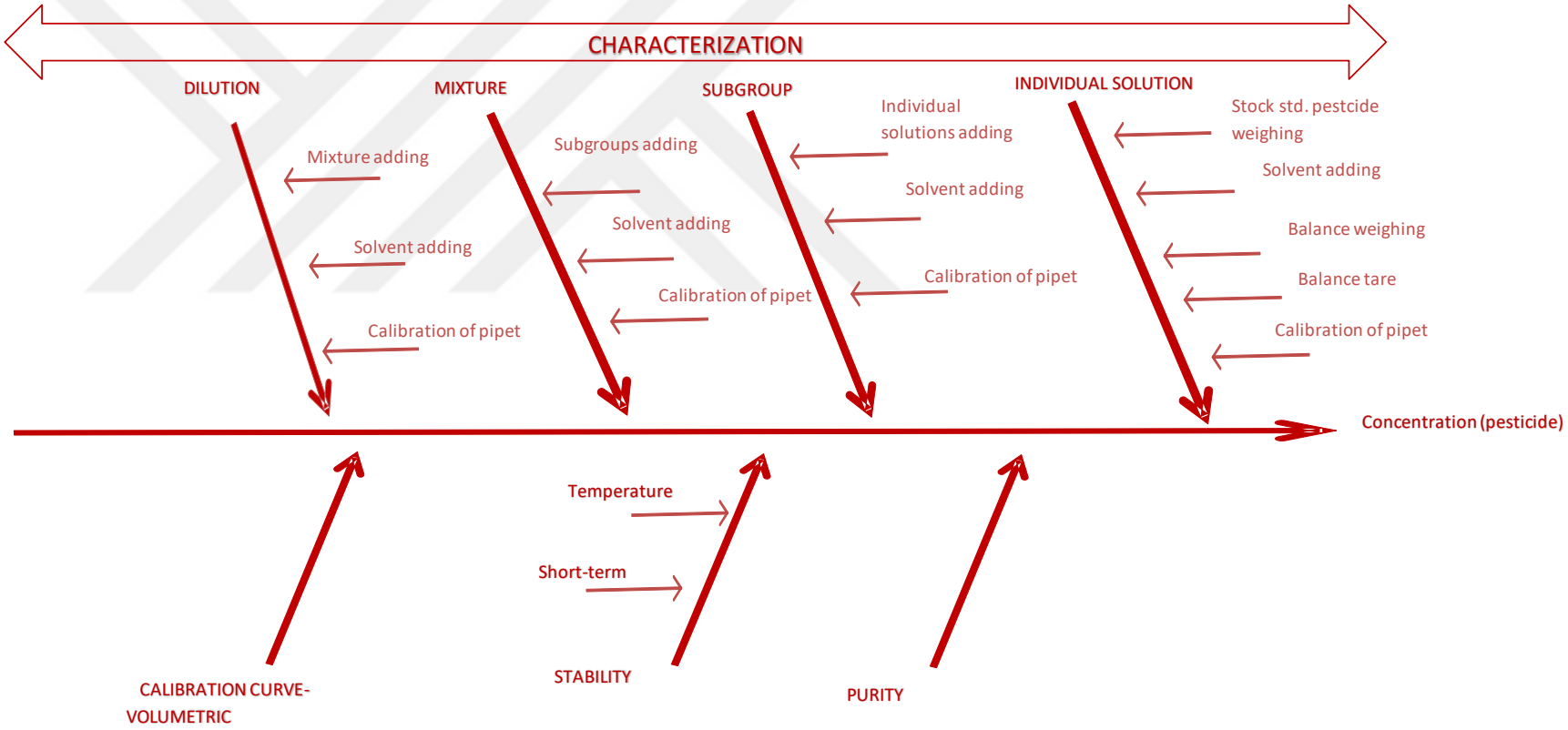


Figure 2.5. Fish bone diagram of preparing CRM volumetrically

2.8 Characterization

Characterization is a mathematical modelling used to determine uncertainty. The main task of this model is to determine all uncertainties that will affect all properties of the RM. In this way, the combined standard uncertainty can be calculated.

The model equation was used to calculate the balance and volumetric uncertainties resulting from the preparation of individual solutions, subgroups and the mixture.

2.8.1 Gravimetrically

The model equation for the solution, mixture and dilution part was created using the following equation 2.1, 2.2 and 2.3, *C (ppm)* refers to concentration for each pesticide. Solute is a solid standard pesticide, individual solution, subgroup, mixture for each step, and solvent is a suitable solvent for standard pesticide, subgroup and mixture for each step.

Solution;

$$C(ppm) = \frac{solutes\ (mg)}{solvent\ 1\ \ (x10^6\ mg)} \tag{2.1}$$

subgroup;

$$C(ppm) = \frac{\frac{solutes\ (mg)}{solvent\ 1\ (x10^6 mg)}}{solvent\ 2\ \ (x10^6\ mg)} \tag{2.2}$$

mixtures;

$$C(ppm) = \frac{\frac{solutes\ (mg)}{solvent\ 2\ (x10^6 mg)}}{solvent\ 3\ \ (x10^6\ mg)} \tag{2.3}$$

2.8.2 Volumetrically

The model equation for the individual solution part was created using the equation 2.4, *C (ppm)* refers to the concentration of the individual solution. Solute is a solid standard pesticide. The equation 2.5 was used for subgroups. Solvents are suitable material using in the individual solution, subgroup and mixture for each step.

Solution;

$$C(ppm) = \frac{solutes\ (mg)}{solvent\ 1\ \ (mL)} \tag{2.4}$$

subgroup;

$$C(ppm) = \frac{\frac{solutes\ (mg)}{solvent\ 1\ (mL)}}{solvent\ 2\ \ (mL)} \tag{2.5}$$

mixtures;

$$C(ppm) = \frac{\frac{solutes\ (mg)}{solvent\ 2\ (mL)}}{solvent\ 3\ \ (mL)} \tag{2.6}$$

In order to calculate uncertainty of characterization for mixtures that were prepared by gravimetric and volumetric method, the following standard deviation (s_y and s_y/y) formulas were applied.

Uncertainty for total;

$$s_y = \sqrt{{s_a}^2 + (s_b)^2 + (s_c)^2} \tag{2.7}$$

Uncertainty for dividing;

$$\frac{s_y}{y} = \sqrt{\left(\frac{s_a}{a}\right)^2 + \left(\frac{s_b}{b}\right)^2 + \left(\frac{s_c}{c}\right)^2} \tag{2.8}$$

2.9 Homogeneity Testing

Two bottles of second mixture (mixture II) of mix A divided into equal volumes, called the first bottle and the second bottle, were prepared gravimetrically to test the difference within and between the bottles. Each bottle was analysed in GC-MS for 5 replicates using the same method for evaluation. The results of the homogeneity tests were subjected to statistical analysis using one-way analysis of variance (ANOVA).

The homogeneity testing was calculated using the following equations and in accordance with ISO Guide 35. There are two main formulas for homogeneity testing. These are the equations 2.9 and 2.11, s_{bb} is the between-bottle standard deviation, which is identical to u_{bb}, which is the between-bottle standard uncertainty. vMS_{wg} is number of degrees of freedom of mean square of within group in equation 2.12 (Https-1, n.d.)

$$s_{bb} = \sqrt{\frac{MS_{bb} - MS_{wg}}{n}} \tag{2.9}$$

$$MS_{bb} = \frac{ss_{bb}}{df_{bb}} \quad (2.10)$$

$$ss_{bb} = \left[\frac{(\sum X_1)^2}{n_1} + \frac{(\sum X_2)^2}{n_2} + \cdots + \frac{(\sum X_k)^2}{n_k}\right] - \left[\frac{(\sum X_1 + \sum X_2 + \cdots + \sum X_k)^2}{N_{total}}\right] \quad (2.11)$$

$$u_{bb} = \sqrt{\frac{MS_{wg}}{n}} \sqrt[4]{\frac{2}{\nu_{MS_{wg}}}} \quad (2.12)$$

$$MS_{wg} = \frac{ss_{wg}}{df_{wg}} \quad (2.13)$$

$$ss_{wg} = [\Sigma(X_1)^2 + \Sigma(X_2)^2 + \cdots + \Sigma(X_k)^2] - \left[\frac{(\sum X_1)^2}{n_1} + \frac{(\sum X_2)^2}{n_2} + \cdots + \frac{(\sum X_k)^2}{n_k}\right] \quad (2.14)$$

In the equation (2.9), MS_{wg} refers to the mean square within group; MS_{bb} refers to the mean square between bottles; n refers to the number of analyses. The experiment was conducted on five replicates. To calculate $MS_{wg,}$ it is necessary to have ss_{wg} and df_{wg} where ss_{wg} is the sum of squares of within group and df_{wg} is the degrees of freedom of within group in equation (2.13). Similarly, ss_{bb}, sum of squares of between bottle and df_{bb}, degrees of freedom of between bottle are necessary to calculate MS_{bb}. Therefore, equations 2.11 and 2.14 are required for ss_{bb} and ss_{wg}, respectively.

If the MS_{bb} is greater than MS_{wg}, u_{bb} or s_{bb} can be chosen as the uncertainty for homogeneity. However, if the MS_{bb} is smaller than MS_{wg}, u_{bb} must be chosen as uncertainty for homogeneity testing (do Rego et al., 2017).

2.10 Stability Testing

Short-term and long-term stability studies were generally carried out for 4 days and 5 months respectively. The short-term studies were carried out at 20°C, -20°C and +4°C, while the long-term studies were carried out at -20°C. The stability results were obtained from the following calculation according to ISO 35 Guide.

X_i and Y_i are expressed the period (day) elapsed and the relative concentration at i day to that at 0 day, respectively. X and Y are mean average values of X_i and Y_i, respectively. b_0 is intercept. From the error analysis, the statements can be calculated from the standard deviations in b_1 and b_0.

$$b_1 = \frac{\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})}{\sum_{i=1}^{n}(X_i - \bar{X})^2} \quad (2.15)$$

$$b_0 = \bar{Y} - b_1 X \quad (2.16)$$

$$s(b_1) = \frac{s}{\sqrt{\sum_{i=1}^{n}(X_i - \bar{X})^2}} \quad (2.17)$$

$$s^2 = \frac{\sum_{i=1}^{n}(Y_i - b_0 - b_1 X_i)^2}{n-2} \quad (2.18)$$

2.11 Considering Purity

The impact of pesticide purity on individual solutions was determined through the purity percentages indicated on their respective certification documents.

2.12 Calibration Curve

The uncertainty of the calibration curve was calculated for all analysis terms. The uncertainty was calculated from the areas and concentrations of the calibration curves plotted at different times according to following equations 2.15 and 2.16. The final uncertainty of each pesticide was determined by taking the average of uncertainty values, given the variation in times.

$$u(C_0) = \frac{S}{B_1}\sqrt{\frac{1}{p} + \frac{1}{n} + \frac{(C_0 - \bar{C})^2}{S_{xx}}} \quad (2.15)$$

$$S_{xx} = \sum_{i=1}^{n}(C_i - \bar{C})^2 \quad (2.16)$$

$u(C_0)$: uncertainty of concentration in calibration standard

S: residual standard deviation coming from calibration curve

B_1: slope of calibration curve

p: number of measurements to determine $u(C_0)$

n: number of measurements for the calibration

C_0: determined pesticide concentration of calibration standard

i: index for the number of measurements to obtain the calibration curve

C_i: individual calibration standard value obtained from the calibration equation.

$\bar{C}$: mean concentrations of calibration standards

3. RESULTS

3.1 Characterization

The calculation of uncertainty of characterisation was evaluated for mix A, B, and C at -20°C. This evaluation was carried out according to model equations

At 20°C, only for 4,4'-DDT it can be accepted as stable because there is not too much difference slope of graph ($|b_1|$) and t *critical* times standard deviation of slope 1 ($t_{crit}*s(b_1)$) in mix A. The highest concentration was seen in 4,4'DDT in mix A and B due to it has a suitable degradation position as chemical structure.

In long term,from the table $t_{critical}$ value was 4.3 for long-term stability at -20°C for both mix A and mix B, heptachlor was evaluated as 3 points and from the table $t_{critical}$ value was 12.7 for mix B in the short and long-term stability at -20°C. The second bottle of 4,4'-DDT in mix A was subjected to a four-month analysis because it was outside of results for fifth months. Therefore, it was ignored.

3.1.1 Gravimetric Preparation

The uncertainty arising from balance exerts a significant influence on the calculation of uncertainty in characterisation. This is due to the fact that pesticides and solvents are organic chemicals. These substances are characterised by their volatility. This inherent volatility introduces an element of uncertainty, which must be addressed to ensure the accuracy of the study. Furthermore, the reliability of the balance is of critical importance in ensuring the validity of the study. The values of linearity and repeatability of balance were taken from the certificate of balance. In the gravimetric studies, calculations were based on rectangular distribution.

3.1.1.1 Characterization of Individual Solutions for Mix A

The uncertainty of individual solution was calculated for mix A as given following tables (Table 3.1 to Table 3.14). Tables of characterization of individual solutions for mix B and mix C are given in appendix 2. In order to calculate characterization of mixtures, rectangular distribution was applied for mix A and mix B while triangular distribution was applied for mix C according to given information in the certificates of pipets, volumetric flasks and the balance.

The HCB, metolachlor and heptachlor-*endo*-epoxide were not determined in mix C. Because the calibration standard for mix C did not include HCB, metolachlor and heptachlor-*endo*-epoxide.

Table 3.1. Calculation of uncertainty of HCB in individual solution

1 Hexachlorobenzene (HCB)

For Sample

$\frac{0.036}{\sqrt{3}}=0.021$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of HCB (mg) 11.8

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of solvent (mg) 4413

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
HCB	11.8	$2.94x10^{-2}$	$6.20x10^{-6}$	$2.49x10^{-3}$
Solvent	4413	$2.94x10^{-2}$	$4.45x10^{-11}$	
u	2678.45	6.67		

2678 ppm ± 6.67

Table 3.2. Calculation of uncertainty of Metolachlor in individual solution

2 metolachlor

For Sample

$\frac{0.036}{\sqrt{3}}=0.021$

Balance:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of metolachlor (mg) 231.25

For Solvent

Balance:

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
metolachlor	231.25	$2.94x10^{-2}$	$1.62x10^{-8}$	$1.27x10^{-4}$
Solvent	27205	$2.94x10^{-2}$	$1.17x10^{-12}$	
u	8500.28	1.08		

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of solvent (mg) 27205

8500 ppm ± 1.08

Table 3.3. Calculation of uncertainty of 4,4’-DDT in individual solution

3 4,4’-DDT

For Sample

$\frac{0.036}{\sqrt{3}}=0.021$

Balance:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of 4,4’-DDT (mg) 41.18

For Solvent

Balance:

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
4,4’-DDT	41.18	$2.94x10^{-2}$	$5.11x10^{-7}$	$7.15x10^{-4}$
Solvent	2287.78	$2.94x10^{-2}$	$1.66x10^{-10}$	
u	18000	12.87		

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036
weight of solvent (mg)	2287.78

18000 ppm ± 12.9

Table 3.4. Calculation of uncertainty of 2,4'-DDT in individual solution

4 2,4'-DDT

For Sample

Balance:

$\frac{0.036}{\sqrt{3}}=0.021$

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

weight of 4,4'-DDT (mg) 16.65

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
2,4'-DDT	16.65	$2.94x10^{-2}$	$3.13x10^{-6}$	$1.77x10^{-3}$
Solvent	1280.77	$2.94x10^{-2}$	$5.28x10^{-10}$	
u	13000	22.99		

weight of solvent (mg) 1280.77

13000 ppm ± 23

Table 3.5. Calculation of uncertainty of 4,4'-DDD in individual solution

5 4,4'-DDD (4.4-TDE)

For Sample

$\frac{0.036}{\sqrt{3}}=0.021$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

weight of 4,4'-DDD (mg) 11.18

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
4,4'-DDD (4.4-TDE)	11.18	$2.94x10^{-2}$	$6.93x10^{-6}$	$2.63x10^{-3}$
Solvent	1176.84	$2.94x10^{-2}$	$6.26x10^{-10}$	
u	9500	25.02		

weight of solvent (mg) 1176.84

9500 ppm ± 25.0

Table 3.6. Calculation of uncertainty of Aldrin in individual solution

6	aldrin (HHDN)	

For Sample

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of aldrin (mg) 20.71

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of solvent (mg) 1746.54

$\frac{0.036}{\sqrt{3}}=0.021$

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
aldrin (HHDN)	20.71	$2.94x10^{-2}$	$2.02x10^{-6}$	$1.42x10^{-3}$
Solvent	1725.83	$2.94x10^{-2}$	$2.91x10^{-10}$	
u	12000	17.06		

12000 ppm ± 17.1

Table 3.7. Calculation of uncertainty of Dieldrin in individual solution

7	dieldrin

For Sample

$$\frac{0.036}{\sqrt{3}} = 0.021$$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

weight of dieldrin (mg) 35.15

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
dieldrin	35.15	$2.94x10^{-2}$	$7.01x10^{-7}$	$8.38x10^{-4}$
Solvent	1952.78	$2.94x10^{-2}$	$2.27x10^{-10}$	
u	18000	15.08		

weight of solvent (mg) 1952.78

18000 ppm ± 15.1

Table 3.8. Calculation of uncertainty of *alpha*-Endosulfan in individual solution

8 *alpha*-endosulfan

For Sample

$$\frac{0.036}{\sqrt{3}} = 0.021$$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability) ^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	2.94×10^{-2}

weight of *alpha*-endosulfan (mg) 31.02

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability) ^2)	
u	0.036

weight of solvent (mg) 1551

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
alpha-endosulfan	31.02	2.94×10^{-2}	9.01×10^{-7}	9.49×10^{-4}
Solvent	1551	2.94×10^{-2}	3.60×10^{-10}	
u	20000	18.98		

20000 ppm ± 18.9

Table 3.9. Calculation of uncertainty of *beta*-Endosulfan in individual solution

9	beta-endosulfan

For Sample

$$\frac{0.036}{\sqrt{3}} = 0.021$$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability) ^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	2.94×10^{-2}

weight of beta-endosulfan (mg) 26.29

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of solvent (mg) 1546.47

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
beta-endosulfan	26.29	2.94×10^{-2}	1.25×10^{-6}	1.12×10^{-3}
Solvent	1546.47	2.94×10^{-2}	3.62×10^{-10}	
u	17000	19.04		

17000 ppm ± 19.0

Table 3.10. Calculation of uncertainty of Endrin in individual solution

10	endrin						
For Sample			$\frac{0.036}{\sqrt{3}}=0.021$				
Balance:			Uncertainty of Balance				
Linearity	0.03		Uncertainty component	*u(X)*			
Repeatability	0.02		Calibration (tare)	0.021			
u=√((linearity)^2+(repeatability) ^2)			Calibration (sample)	0.021			
u	0.036		Combined Uncertainty	$2.94x10^{-2}$			
weight of endrin (mg)	31.03						
For Solvent							
Balance:				*Value(X)*	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Linearity	0.03		endrin	31.03	$2.94x10^{-2}$	$9.00x10^{-7}$	$9.49x10^{-4}$
Repeatability	0.02		Solvent	2068.67	$2.94x10^{-2}$	$2.03x10^{-10}$	
u=√((linearity)^2+(repeatability) ^2)			u	15000	14.23		
u	0.036						
weight of solvent (mg)	2068.67		15000 ppm ± 14.2				

Table 3.11. Calculation of uncertainty of *alpha*-HCH in individual solution

11 HCH-*alpha* (Alpha BHC)

For Sample

$\frac{0.036}{\sqrt{3}}=0.021$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability) ^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

weight of *alpha*-HCH (mg) 39.25

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability) ^2)	
u	0.036

weight of solvent (mg) 2180.56

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
HCH-*alpha* (Alpha BHC)	39.25	$2.94x10^{-2}$	$5.63x10^{-7}$	$7.50x10^{-4}$
Solvent	2180.56	$2.94x10^{-2}$	$1.82x10^{-10}$	
u	18000	13.50		

18000 ppm ± 13.5

Table 3.12. Calculation of uncertainty of *gamma*-HCH in individual solution

12	HCH-*gamma* (Lindane. Gamma BHC)

For Sample

$\frac{0.036}{\sqrt{3}}=0.021$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

weight of gamma-HCH (mg) 14.23

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of solvent (mg) 1293.64

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
HCH-*gamma* (Lindane. Gamma BHC)	14.23	$2.94x10^{-2}$	$4.28x10^{-6}$	$2.07x10^{-3}$
Solvent	1293.64	$2.94x10^{-2}$	$5.18x10^{-10}$	
u	11000	22.76		

11000 ppm ± 22.8

Table 3.13. Calculation of uncertainty of Heptachlor in individual solution

13	heptachlor	

For Sample

$\frac{0.036}{\sqrt{3}}$=0.021

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

weight of heptachlor (mg) 27.69

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
heptachlor	27.69	$2.94x10^{-2}$	$1.13x10^{-6}$	$1.06x10^{-3}$
Solvent	1538.33	$2.94x10^{-2}$	$3.66x10^{-10}$	
u	18000	19.14		

weight of solvent (mg) 1538.33

18000 ppm ± 19.1

Table 3.14. Calculation of uncertainty of Heptachlor-*endo*-epoxide in individual solution

14	heptachlor-*endo*-epoxide (Isomer A) (Trans-heptachloroepoxide)	

For Sample

$\frac{0.036}{\sqrt{3}}=0.021$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

weight of heptachlor endoepoxide (mg) 15.11

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of solvent (mg) 1888.75

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
heptachlor-*endo*-epoxide (Isomer A) (Trans-heptachloroepoxide)	15.11	$2.94x10^{-2}$	$3.80x10^{-6}$	$1.95x10^{-3}$
Solvent	1888.75	$2.94x10^{-2}$	$2.43x10^{-10}$	
u	8000	15.59		

8000 ppm ± 15.59

3.1.1.2 Characterization of Subgroups for Mix A

The uncertainty of subgroups was determined to find exact concentration of subgroups in the characterization of mix A. For example, in the preparation of group 2, metolachlor must be added as 588.24 mg by calculation however in practice in weighing process erroneously we have added 6 mg more. Therefore, it is necessary to find exact concentration of subgroups for each pesticide (Table 3.15 and Table 3.16) and this is one of the justifications to do characterization.

Table 3.15. Table of characterization of subgroups for mixture I of mix A

group2 (1000 ppm 5000 mg)					mixture I
Nu	**Name**	**Conc (ppm)**	**Weight (mg)**	**Exact Conc (ppm)**	
1	metolachlor*	8500	588.2	1010.2	
2	ethoprophos (Prophos)	10000	500	1000	
3	mevinphos	8000	625	1000	
4	isofenphos	7500	666.7	1000	
5	diazinon	9200	543.5	1000	
6	cyfluthrin (mixture of isomers)	8900	561.8	1000	
group16 (400 ppm 2000 mg)					
Nu	**Name**	**Conc (ppm)**	**Weight (mg)**	**Exact Conc (ppm)**	
1	HCB*	2678.5	298.7	400	
2	diphenamid	2000	400.0	401	
3	mirex	2000	400.0	402	
4	tetrasul	3000	266.7	403	
5	iprodione	2000	400.0	400	

Table 3.16. Table of characterization of subgroups for mixture II of mix A

group5 (1400 ppm 1200 mg)					mixture II
Nu	**Name**	**Conc (ppm)**	**Weight (mg)**	**Exact Conc (ppm)**	
1	heptachlor endo epoxide*	8000	210.0	1413.3	
2	fenvalerate	7000	240.0	1400.0	
3	pyrazophos	12000	140.0	1410.0	
4	chlorothalonil	8000	210.0	1400.0	
5	oxyfluorfen	10000	168.0	1400.0	
group7 (1500 ppm 1500 mg)					
Nu	**Name**	**Conc (ppm)**	**Weight (mg)**	**Exact Conc (ppm)**	
1	endrin*	15000	150.0	1500	
2	aldrin*	12000	187.5	1548	
3	chlorthal-dimethyl (DCPA. TCTP. Dacthal)	5000	450.0	1500	
4	nitrofen	6000	375.0	1500	
5	biphenyl	30000	75.0	1500	

Table 3.16 (continued). Table of characterization of subgroups for mixture II of mix A

group10 (1100 ppm 2000 mg)					mixture II
Nu	**Name**	**Conc (ppm)**	**Weight (mg)**	**Exact Conc (ppm)**	
1	4,4'-DDD*	9500	231.6	1100	
2	4,4'-DDE	10000	220.0	1100	
3	diflufenican	10000	220.0	1100	
4	hch-beta (beta bhc)	10000	220.0	1105	
5	2,4'-ddd	20000	110.0	1110	
6	cyhalothrin-lambda	25000	88.0	1100	
7	methoxychlor	11000	200.0	1122	
8	2.4-DDE	11000	200.0	1100	
9	flurochloridone	20000	110.0	1100	

group11 (1100 ppm 2000 mg)					
Nu	**Name**	**Conc (ppm)**	**Weight (mg)**	**Exact Conc (ppm)**	
1	*gamma*-HCH*	11000	200.0	1100	
2	*alpha*-endosulfan*	20000	110.0	1110	
3	dicofol (kelthane)	11000	200.0	1100	
4	cypermethrin-alpha (alphamethrin)	20000	110.0	1100	
5	cyhalofop-butyl	19000	115.8	1100	
6	trifluralin	20000	110.0	1100	
7	vinclozolin	8000	275.0	1100	
8	2-Phenylphenol (Ortho phenylphenol)	12000	183.3	1100	
9	oxadiazon	18000	122.2	1100	
10	bitertanol (biloxazol) (mixture of izomers and diastomers)	8000	275.0	1100	

Table 3.16 (continued). Table of characterization of subgroups for mixture II of mix A

group12 (1100 ppm 2000 mg)					mixture II
Nu	**Name**	**Conc (ppm)**	**Weight (mg)**	**Exact Conc (ppm)**	
1	heptachlor*	18000	122.2	1100	
2	4,4'-DDT*	18000	122.2	1127	
3	metazachlor	12000	183.3	1100	
4	benalaxyl	12000	183.3	1100	
5	benfluralin	18000	122.2	1100	
6	tetradifon	8000	275.0	1100	
7	spiromesifen	18000	122.2	1100	
8	quinoxyfen	12000	183.3	1100	
9	azinphos-ethyl	12000	183.3	1100	
10	esfenveralate	18000	122.2	1100	

Table 3.16 (continued). Table of characterization of subgroups for mixture II of mix A

group13 (1300 ppm 2000 mg)					mixture II
Nu	**Name**	**Conc (ppm)**	**Weight (mg)**	**Exact Conc (ppm)**	
1	*alpha*-HCH*	18000	144.4	1300	
2	*beta*-endosulfan*	17000	152.9	1300	
3	diclofop-methyl	12000	216.7	1300	
4	ethalfluralin	17000	152.9	1300	
5	dichloran (DCNA; ditranil)	12500	208.0	1312.5	
6	chlordecone (kepone)	17000	152.9	1300	
7	profenofos	8000	325.0	1300	

Table 3.16 (continued). Table of characterization of subgroups for mixture II of mix A

group15 (1800 ppm 1600 mg)					mixture II
Nu	**Name**	**Conc (ppm)**	**Weight (mg)**	**Exact Conc (ppm)**	
1	2,4'-DDT*	13000	221.5	1800	
2	dieldrin*	18000	160.0	1811.3	
3	tolylfluanid	13000	221.5	1800	
4	diphenylamine (DPA)	14000	205.7	1800	
5	aclonifen	15000	192.0	1818.8	
6	dimethachlor	15000	192.0	1800	
7	endosulfan sulfate	15000	192.0	1800	

* In the study. 14 pesticides were determined by using GC-MS because there were calibration standards for these 14 pesticides. Therefore, uncertainty of subgroups was calculated for these pesticides.

After determining exact concentrations of each pesticide (determined pesticide) within the subgroups, their uncertainties were calculated and tableted from Table 3.17 to Table 3.30 for mix A. The characterization calculations of pesticides in mix B is given in appendix 3.

Table 3.17. The uncertainty of Metolachlor in subgroup 2 for mixture I of mix A

group2 (1000 ppm 5000 mg)

Uncertainty for solvent:

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of materials	3491.2
Weight of solvent	1508.8

	Value(X)	*u(X)*	
metolachlor	594.2	$2.94x10^{-2}$	$8.67x10^{-4}$
ethoprophos (prophos)	500	$2.94x10^{-2}$	$8.67x10^{-4}$
mevinphos	625	$2.94x10^{-2}$	$8.67x10^{-4}$
ısofenphos	666.7	$2.94x10^{-2}$	$8.67x10^{-4}$
diazinon	543.5	$2.94x10^{-2}$	$8.67x10^{-4}$
cyfluthrin (mixture of isomers)	561.8	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	1508.8	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0779		

5000 mg ± 0.0779

For uncertainty of metalochlor in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1} \qquad 1010\ ppm\ \pm\ ? = \frac{(8500\ ppm \pm 1.08) * (594.2\ mg \pm 0.0294)}{5000\ mg \pm 0.0779}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of metolachlor (ind. soln)	8500	1.08	$1.62x10^{-8}$	
Amount of metalachlor	594.2	$2.94x10^{-2}$	$2.45x10^{-9}$	0.0014
Solvent	5000	0.0779	$2.43x10^{-8}$	
u	1010	0.14		

1010 ppm ± 0.14

Table 3.18. The uncertainty of HCB in subgroup 16 for mixture I of mix A

group16 (400 ppm 2000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$
Total weight of pesticides	1770.3
Weight of solvent	229.7

Uncertainty for solvent:

	Value(X)	*u(X)*	
HCB	298.7	$2.94x10^{-2}$	$8.67x10^{-4}$
diphenamid	401	$2.94x10^{-2}$	$8.67x10^{-4}$
mirex	402	$2.94x10^{-2}$	$8.67x10^{-4}$
tetrasul	268.7	$2.94x10^{-2}$	$8.67x10^{-4}$
ıprodione	400	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	229.7	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0721		

2000 mg ± 0.0721

For uncertainty of HCB in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1} \quad 400\ ppm\ \pm ? = \frac{(2678.5\ ppm\ \pm 6.67) * (298.7\ mg\ \pm 0.0294)}{2000\ mg\ \pm 0.0721}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of HCB (ind. soln)	2678.5	6.67	$6.20x10^{-6}$	0.0025
Amount of HCB	298.7	$2.94x10^{-2}$	$9.71x10^{-9}$	
Solvent	2000	0.0721	$1.0x10^{-8}$	
u	400	1.00		

400 ppm ± 1.00

Table 3.19. The uncertainty of Heptachlor-*endo*-epoxide in subgroup 5 for mixture II of mix A

group5 (1400 ppm 1200 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	970.00
Weight of solvent	230.00

Uncertainty for solvent:

	Value(X)	*u(X)*	
heptachlor-*endo*-epoxide	212	$2.94x10^{-2}$	$8.67x10^{-4}$
fenvalerate	240	$2.94x10^{-2}$	$8.67x10^{-4}$
pyrazophos	140	$2.94x10^{-2}$	$8.67x10^{-4}$
chlorothalonil	210	$2.94x10^{-2}$	$8.67x10^{-4}$
oxyfluorfen	168	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	230	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0721		

1200 mg ± 0.0721

For uncertainty of heptachlor-*endo*-epoxide in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$1413\ ppm\ \pm\ ? = \frac{(8000\ \text{ppm} \pm 15.59\ ) * (212\ mg\ \pm 0.0294)}{1200\ mg\ \pm 0.0721}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of heptachlor-*endo*-epoxide (ind. soln)	8000	15.59	$4.0x10^{-5}$	0.0020
Amount of heptachlor-*endo*-epoxide	212	$2.94x10^{-2}$	$1.92x10^{-8}$	
Solvent	1200	0.0721	$3.6x10^{-9}$	
u	1413	2.76		

1413 ppm ± 2.76

Table 3.20. The uncertainty of Endrin in subgroup 7 for mixture II of mix A

group7 (1500 ppm 1500 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1243.5
Weight of solvent	256.5

Uncertainty for solvent:

	Value(X)	*u(X)*	
endrin	150	$2.94x10^{-2}$	$8.67x10^{-4}$
aldrin	193.5	$2.94x10^{-2}$	$8.67x10^{-4}$
chlorthal-dimethyl (DCPA. TCTP. Dacthal)	450	$2.94x10^{-2}$	$8.67x10^{-4}$
nitrofen	375	$2.94x10^{-2}$	$8.67x10^{-4}$
biphenyl	75	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	256.5	$2.94x10^{-2}$	$8.67x10^{-4}$
u		0.0721	

1500 mg ± 0.0721

For uncertainty of endrin in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$1500\ ppm\ \pm ? = \frac{(15000\ ppm \pm 14.23) * (150\ mg \pm 0.0294)}{1500\ mg \pm 0.0721}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of endrin (ind. soln)	15000	14.23	$9.00x10^{-7}$	0.0010
Amount of endrin	150	$2.94x10^{-2}$	$3.85x10^{-8}$	
Solvent	1500	0.0721	$2.31x10^{-9}$	
u	1500		1.46	

1500 ppm ± 1.46

Table 3.21. The uncertainty of Aldrin in subgroup 7 for mixture II of mix A

grup7 (1500 ppm 1500 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1243.5
Weight of solvent	256.5

	Value(X)	*u(X)*	
endrin	150	$2.94x10^{-2}$	$8.67x10^{-4}$
aldrin	193.5	$2.94x10^{-2}$	$8.67x10^{-4}$
chlorthal-dimethyl (dcpa. tctp. dacthal)	450	$2.94x10^{-2}$	$8.67x10^{-4}$
nitrofen	375	$2.94x10^{-2}$	$8.67x10^{-4}$
biphenyl	75	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	256.5	$2.94x10^{-2}$	$8.67x10^{-4}$
u		0.0721	
1500 mg ± 0.0721			

For uncertainty of aldrin in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$1548\,ppm \pm ? = \frac{(12000\,ppm \pm 17.06) * (150\,mg \pm 0.0294)}{1500\,mg \pm 0.0721}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2 + \ldots [X/u(x)]_n^2}$
Concentration of aldrin (ind. soln)	12000	17.06	$2.02x10^{-6}$	
Amount of aldrin	193.5	$2.94x10^{-2}$	$2.31x10^{-8}$	0.001
Solvent	1500	0.0721	$2.31x10^{-9}$	
u	1548	2.21		
1548 ppm ± 2.21				

Table 3.22. The uncertainty of 4,4'-DDD in subgroup 10 for mixture II of mix A

group10 (1100 ppm 2000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1607.58
Weight of solvent	392.42

Uncertainty for solvent:

	Value(X)	*u(X)*	
4,4'-DDD	231.58	$2.94x10^{-2}$	$8.67x10^{-4}$
4,4'-DDE	220	$2.94x10^{-2}$	$8.67x10^{-4}$
diflufenican	220	$2.94x10^{-2}$	$8.67x10^{-4}$
HCH-beta (Beta BHC)	221	$2.94x10^{-2}$	$8.67x10^{-4}$
2.4-DDD	111	$2.94x10^{-2}$	$8.67x10^{-4}$
cyhalothrin-lambda	88	$2.94x10^{-2}$	$8.67x10^{-4}$
methoxychlor	206	$2.94x10^{-2}$	$8.67x10^{-4}$
2,4'-DDE	200	$2.94x10^{-2}$	$8.67x10^{-4}$
flurochloridone	110	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	392.42	$2.94x10^{-2}$	$8.67x10^{-4}$
u		0.0931	

2000 mg ± 0.0931

For uncertainty of 4,4'-DDD in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$1100\ ppm\ \pm ? = \frac{(9500\ ppm \pm 25.02) * (231.6\ mg \pm 0.0294)}{2000\ mg \pm 0.0931}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2 + \ldots [X/u(x)]_n^2}$
Concentration of 4,4'-DDD (ind. soln)	9500	25.01	$6.93x10^{-6}$	$2.64x10^{-3}$
Amount of 4,4'-DDD	231.58	$2.94x10^{-2}$	$1.62x10^{-8}$	
Solvent	2000	0.0931	$2.17x10^{-9}$	
u	1100	2.90		

1100 ppm ± 2.90

Table 3.23. The uncertainty of *gamma*-HCH in subgroup 11 for mixture II of mix A

group11 (1100 ppm 2000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1702.35
Weight of solvent	297.65

	Value(X)	*u(X)*	
gamma-HCH	200	$2.94x10^{-2}$	$8.67x10^{-4}$
alpha-endosulfan	111	$2.94x10^{-2}$	$8.67x10^{-4}$
dicofol (kelthane)	200	$2.94x10^{-2}$	$8.67x10^{-4}$
cypermethrin-*alpha* (alphamethrin)	110	$2.94x10^{-2}$	$8.67x10^{-4}$
cyhalofop-butyl	116	$2.94x10^{-2}$	$8.67x10^{-4}$
trifluralin	110	$2.94x10^{-2}$	$8.67x10^{-4}$
vinclozolin	275	$2.94x10^{-2}$	$8.67x10^{-4}$
2-Phenylphenol (Ortho phenylphenol)	183.3	$2.94x10^{-2}$	$8.67x10^{-4}$
oxadiazon	122.2	$2.94x10^{-2}$	$8.67x10^{-4}$
bitertanol (biloxazol) (mixture of izomers and diastomers)	275	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	1725	$2.94x10^{-2}$	$8.67x10^{-4}$
u		0.0976	
2000 mg ± 0.0976			

For uncertainty of *gamma*-HCH in subgroup
C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1} \qquad 1100\ ppm\ \pm ? = \frac{(11000\ \text{ppm} \pm 22.76) * (200\ mg \pm 0.0294)}{2000\ mg \pm 0.0976}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentaion of *gamma*-HCH (ind. soln)	11000	22.76	$4.28x10^{-6}$	$2.07x10^{-3}$
Amount of *gamma*-HCH	200	$2.94x10^{-2}$	$2.17x10^{-8}$	
Solvent	2000	0.0976	$2.38x10^{-9}$	
u	1100	2.28		
1100 ppm ± 2.28				

Table 3.24. The uncertainty of *alpha*-Endosulfan in subgroup 11 for mixture II of mix A

group11 (1100 ppm 2000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1702.35
Weight of solvent	297.65

	Value(X)	*u(X)*	
gamma-HCH	200	$2.94x10^{-2}$	$8.67x10^{-4}$
alpha-endosulfan	111	$2.94x10^{-2}$	$8.67x10^{-4}$
dicofol (kelthane)	200	$2.94x10^{-2}$	$8.67x10^{-4}$
cypermethrin-*alpha* (alphamethrin)	110	$2.94x10^{-2}$	$8.67x10^{-4}$
cyhalofop-butyl	116	$2.94x10^{-2}$	$8.67x10^{-4}$
trifluralin	110	$2.94x10^{-2}$	$8.67x10^{-4}$
vinclozolin	275	$2.94x10^{-2}$	$8.67x10^{-4}$
2-Phenylphenol (Ortho phenylphenol)	183.3	$2.94x10^{-2}$	$8.67x10^{-4}$
oxadiazon	122.2	$2.94x10^{-2}$	$8.67x10^{-4}$
bitertanol (biloxazol) (mixture of izomers and diastomers)	275	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	1725	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0976		
2000 mg ± 0.0976			

For uncertainty of *alpha*-endosulfan in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1} \quad 1110\ ppm\ \pm\ ? = \frac{(20000\ \text{ppm} \pm 18.98) * (111\ mg \pm 0.0294)}{2000\ mg \pm 0.0976}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of *alpha*-endosulfan (ind. soln)	20000	18.98	$9.01x10^{-7}$	
Amount of *alpha*-endosulfan	111	$2.94x10^{-2}$	$7.03x10^{-8}$	$9.87x10^{-4}$
Solvent	2000	0.0976	$2.38x10^{-9}$	
u	1110	1.10		
1110 ppm ± 1.10				

Table 3.25. The uncertainty of Heptachlor in subgroup 12 for mixture II of mix A

group12 (1100 ppm 2000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1622.4
Weight of solvent	377.6

	Value(X)	*u(X)*	
heptachlor	122.2	$2.94x10^{-2}$	$8.67x10^{-4}$
4,4'-DDT	125.2	$2.94x10^{-2}$	$8.67x10^{-4}$
metazachlor	183.3	$2.94x10^{-2}$	$8.67x10^{-4}$
benalaxyl	183.3	$2.94x10^{-2}$	$8.67x10^{-4}$
benfluralin	122.2	$2.94x10^{-2}$	$8.67x10^{-4}$
tetradifon	275	$2.94x10^{-2}$	$8.67x10^{-4}$
spiromesifen	122.2	$2.94x10^{-2}$	$8.67x10^{-4}$
quinoxyfen	183.3	$2.94x10^{-2}$	$8.67x10^{-4}$
azinphos-ethyl	183.3	$2.94x10^{-2}$	$8.67x10^{-4}$
esfenveralate	122.2	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	377.6	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0976		
2000 mg ± 0.0976			

For uncertainty of heptachlor in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$1100\ ppm\ \pm\ ? = \frac{(18000\ \text{ppm} \pm 19.14) * (122.2\ mg \pm 0.0294)}{2000\ mg \pm 0.0976}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of heptachlor (ind. soln)	18000	19.14	$1.13x10^{-6}$	$1.09x10^{-3}$
Amount of heptachlor	122.2	$2.94x10^{-2}$	$5.80x10^{-8}$	
Solvent	2000	0.0976	$2.38x10^{-9}$	
u	1100	1.20		
1100 ppm ± 1.20				

Table 3.26. The uncertainty of 4,4'-DDT in subgroup 12 for mixture II of mix A

group12 (1100 ppm 2000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1622.4
Weight of solvent	377.6

	Value(X)	*u(X)*	
heptachlor	122.2	$2.94x10^{-2}$	$8.67x10^{-4}$
4,4'-DDT	125.2	$2.94x10^{-2}$	$8.67x10^{-4}$
metazachlor	183.3	$2.94x10^{-2}$	$8.67x10^{-4}$
benalaxyl	183.3	$2.94x10^{-2}$	$8.67x10^{-4}$
benfluralin	122.2	$2.94x10^{-2}$	$8.67x10^{-4}$
tetradifon	275	$2.94x10^{-2}$	$8.67x10^{-4}$
spiromesifen	122.2	$2.94x10^{-2}$	$8.67x10^{-4}$
quinoxyfen	183.3	$2.94x10^{-2}$	$8.67x10^{-4}$
azinphos-ethyl	183.3	$2.94x10^{-2}$	$8.67x10^{-4}$
esfenveralate	122.2	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	377.6	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0976		
2000 mg ± 0.0976			

For uncertainty of 4,4'-DDT in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1} \qquad 1127\ ppm\ \pm\ ? = \frac{(18000\ \text{ppm} \pm 12.87) * (125.2\ mg \pm 0.0294)}{2000\ mg \pm 0.0976}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of 4,4'-DDT (ind. soln)	18000	12.87	$5.11x10^{-7}$	$7.54x10^{-4}$
Amount of 4,4'-DDT	125.2	$2.94x10^{-2}$	$5.53x10^{-8}$	
Solvent	2000	0.0976	$2.38x10^{-9}$	
u	1127	0.85		
1127 ppm ± 0.85				

Table 3.27. The uncertainty of *alpha*-HCH in subgroup 13 for mixture II of mix A

group13 (1300 ppm 2000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1354.9
Weight of solvent	645.1

	Value(X)	*u(X)*	
alpha-HCH	144.4	$2.94x10^{-2}$	$8.67x10^{-4}$
beta-endosulfan	152.9	$2.94x10^{-2}$	$8.67x10^{-4}$
diclofop-methyl	216.7	$2.94x10^{-2}$	$8.67x10^{-4}$
ethalfluralin	152.9	$2.94x10^{-2}$	$8.67x10^{-4}$
dichloran (DCNA; Ditranil)	210	$2.94x10^{-2}$	$8.67x10^{-4}$
chlordecone (kepone)	152.9	$2.94x10^{-2}$	$8.67x10^{-4}$
profenofos	325	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	645.1	$2.94x10^{-2}$	$8.67x10^{-4}$
u		0.0833	
2000 mg ± 0.0833			

For uncertainty of *alpha*-HCH in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$1300\ ppm\ \pm\ ? = \frac{(18000\ \text{ppm} \pm 13.50) * (144.4\ mg \pm 0.0294)}{2000\ mg \pm 0.0833}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of alp*ha*-HCH (ind. soln)	18000	13.50	$5.63x10^{-7}$	$7.78x10^{-4}$
Amount of *alpha*-HCH	144.4	$2.94x10^{-2}$	$4.15x10^{-8}$	
Solvent	2000	0.0833	$1.73x10^{-9}$	
u	1300	1.01		
1300 ppm ± 1.01				

Table 3.28. The uncertainty of *beta*-Endosulfan in subgroup 13 for mixture II of mix A

group13 (1300 ppm 2000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1354.9
Weight of solvent	645.1

	Value(X)	*u(X)*	
alpha-HCH	144.4	$2.94x10^{-2}$	$8.67x10^{-4}$
beta-endosulfan	152.9	$2.94x10^{-2}$	$8.67x10^{-4}$
diclofop-methyl	216.7	$2.94x10^{-2}$	$8.67x10^{-4}$
ethalfluralin	152.9	$2.94x10^{-2}$	$8.67x10^{-4}$
dichloran (DCNA; ditranil)	210.0	$2.94x10^{-2}$	$8.67x10^{-4}$
chlordecone (kepone)	152.9	$2.94x10^{-2}$	$8.67x10^{-4}$
profenofos	325.0	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	645.1	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0833		
2000 mg ± 0.0833			

For uncertainty of *beta*-endosulfan in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$1300\ ppm\ \pm\ ? = \frac{(17000\ \text{ppm} \pm 19.0) * (152.94\ mg\ \pm 0.0294)}{2000\ mg\ \pm 0.0833}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of *beta*- endosulfan (ind. soln)	17000	19.0	$1.25x10^{-6}$	
Amount of *beta*-endosulfan	152.9	$2.94x10^{-2}$	$3.71x10^{-8}$	$1.14x10^{-3}$
Solvent	2000	0.08	$1.73x10^{-9}$	
u	1300	1.48		
1300 ppm ± 1.48				

Table 3.29. The uncertainty of 2,4’-DDT in subgroup 15 for mixture II of mix A

group15 (1800 ppm 1600 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1387.8
Weight of solvent	212.2

	Value(X)	*u(X)*	
2,4’-DDT	221.5	$2.94x10^{-2}$	$8.67x10^{-4}$
dieldrin	161.0	$2.94x10^{-2}$	$8.67x10^{-4}$
tolylfluanid	221.5	$2.94x10^{-2}$	$8.67x10^{-4}$
diphenylamine (dpa)	205.7	$2.94x10^{-2}$	$8.67x10^{-4}$
aclonifen	194.0	$2.94x10^{-2}$	$8.67x10^{-4}$
dimethachlor	192.0	$2.94x10^{-2}$	$8.67x10^{-4}$
endosulfan sulfate	192.0	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	212.2	$2.94x10^{-2}$	$8.67x10^{-4}$
u		0.0833	
1600 mg ± 0.0833			

For uncertainty of 2,4’-DDT in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$1800\ ppm\ \pm\ ? = \frac{(13000\ ppm\ \pm 22.99) * (221.54\ mg\ \pm 0.0294)}{1600\ mg\ \pm 0.0833}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of 2,4’-DDT (ind. soln)	13000	22.99	$3.13x10^{-6}$	$1.77x10^{-3}$
Amount of 2,4’-DDT	221.5	$2.94x10^{-2}$	$1.77x10^{-8}$	
Solvent	1600	0.0833	$2.71x10^{-9}$	
u	1800	3.19		
1800 ppm ± 3.19				

Table 3.30. The uncertainty of Dieldrin in subgroup 13 for mixture II of mix A

group15 (1800 ppm 1600 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1387.8
Weight of solvent	212.2

	Value(X)	*u(X)*		
2,4'-DDT	221.5	$2.94x10^{-2}$	$8.67x10^{-4}$	
dieldrin	161.0	$2.94x10^{-2}$	$8.67x10^{-4}$	
tolylfluanid	221.5	$2.94x10^{-2}$	$8.67x10^{-4}$	
diphenylamine (DPA)	205.7	$2.94x10^{-2}$	$8.67x10^{-4}$	
aclonifen	194.0	$2.94x10^{-2}$	$8.67x10^{-4}$	
dimethachlor	192.0	$2.94x10^{-2}$	$8.67x10^{-4}$	
endosulfan sulfate	192.0	$2.94x10^{-2}$	$8.67x10^{-4}$	
Weight of solvent	212.2	$2.94x10^{-2}$	$8.67x10^{-4}$	
u		0.0833		
1600 mg ± 0.0833				

For uncertainty of dieldrin in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$1811\ ppm\ \pm ? = \frac{(18000\ \text{ppm} \pm 15.08) * (161\ mg\ \pm 0.0294)}{1600\ mg\ \pm 0.0833}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of dieldrin (ind. soln)	18000	15.08	$7.02x10^{-7}$	$8.59x10^{-4}$
Amount of dieldrin	161	$2.94x10^{-2}$	$3.34x10^{-8}$	
Solvent	1600	0.0833	$2.71x10^{-9}$	
u	1811	1.56		
1811 ppm ± 1.56				

3.1.1.3 Characterization of Mixtures for Mix A

The uncertainty of mixtures (mixture I and II) was determined to find exact concentration of mixtures in mix A. These mixtures concentration was assumed to be around 100 ppm for mix A and mix B. However, their exact concentrations were calculated considering the real volumes and masses in practice in preparing of the mixtures.

When mixture II was prepared, group 9 and group 12 was added excess 2 and 1 mg, respectively. Therefore, their exact concentrations are 100.2 and 100.1 ppm, respectively. Tables of characterization of mixtures for mix B are given in appendix 4.

Table 3.31. Table of characterization of mixtures for mixture I of mix A

mix A-mixture I (100 ppm 7000 mg)			
		7000 mg	
	Conc. (ppm)	**Weight (mg)**	**mixture Conc. (ppm)**
group 1 (599 ppm)	599	1168.6	100
group 2 (1000 ppm)	1000	700	100
group 3 (800 ppm)	800	875	100
group16 (400 ppm)	400	1750	100

Conc.: concentration

ppm: mg/kg

Table 3.32. Table of characterization of mixtures for mixture II of mix A

mix A-mixture II (100 ppm 10000 mg)			
		10000 mg	
	Conc. (ppm)	**Weight (mg)**	**mixture Conc. (ppm)**
group4 (1000 ppm)	1000	1000	100
group5 (1400 ppm)	1400	714.3	100
group6 (1700 ppm)	1600	625.0	100
group7 (1500 ppm)	1500	666.7	100
group8 (1100 ppm)	1100	909.1	100
group9 (1200 ppm)	1200	833.3	100.2
group10 (1100 ppm)	1100	909.1	100
group11 (1100 ppm)	1100	909.1	100
group12 (1100 ppm)	1100	909.1	100.1
group13 (1300 ppm)	1300	769.2	100
group14 (1400 ppm)	1400	714.3	100
group15 (1800 ppm)	1800	555.6	100

Conc.: concentration

ppm: mg/kg

Table 3.33. Characterization of HCB in mixture I of mix A

mix A-mixture I (100 ppm 7000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of groups	4493.6
Weight of solvent	2506.4

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 1	1168.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 2	700.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 3	875.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 16	1750.0	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	2506.4	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0658		
7000 mg ± 0.0658			

For uncertainty of HCB in mixture

C1*W1=C2*W2 $C1 = \frac{C2 * W2}{W1}$

$$100\ ppm\ \pm ? = \frac{(400\ ppm \pm 1.00) * (1750\ mg \pm 0.0294)}{7000\ mg \pm 0.0658}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of HCB (group 16)	400	1.00	$6.25x10^{-6}$	$2.50x10^{-3}$
Amount of HCB	1750	$2.94x10^{-2}$	$2.83x10^{-10}$	
Solvent	7000	0.0658	$8.84x10^{-11}$	
u	100	0.25		
100 ppm ± 0.25				

Table 3.34. Characterization of Metolachlor in mixture I of mix A

mix A-mixture I (100 ppm 7000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of groups	4493.6
Weight of solvent	2506.4

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 1	1168.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 2	700.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 3	875.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 16	1750.0	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	2506.4	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0658		
7000 mg ± 0.0658			

For uncertainty of metalochlor in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$101\ ppm\ \pm\ ? = \frac{(1010\ ppm\ \pm\ 0.14) * (700\ mg\ \pm 0.0294)}{7000\ mg\ \pm 0.106}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of metolachlor (group 2)	1010	0.14	$1.92x10^{-8}$	$1.45x10^{-4}$
Amount of metolachlor	700	$2.94x10^{-2}$	$1.77x10^{-9}$	
Solvent	7000	0.0658	$8.84x10^{-11}$	
u	101	0.01		
101 ppm ± 0.01				

Table 3.35. Characterization of Heptachlor-*endo*-epoxide in mixture II of mix A

mix A-mixture II (100 ppm 10000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of groups	9517.7
Weight of solvent	482.3

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1000.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	625.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	666.7	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	835.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	910.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	769.2	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	482.3	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
10000 mg ± 0.106			

For uncertainty of heptachlor-endo-epoxide in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1} \quad 101\ ppm\ \pm ? = \frac{(1413\ \text{ppm} \pm 1.19) * (714.3\ mg \pm 0.0294)}{10000\ mg \pm 0.106}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of heptachlor-endo-epoxide (group 5)	1413	1.19	$7.09x10^{-7}$	
Amount of heptachlor-endo-epoxide	714.3	$2.94x10^{-2}$	$1.70x10^{-9}$	$8.43x10^{-4}$
Solvent	10000	0.106	$1.12x10^{-10}$	
u	101	0.09		
101 ppm ± 0.09				

Table 3.36. Characterization of Endrin in mixture II of mix A

mix A-mixture II (100 ppm 10000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of groups	9517.7
Weight of solvent	482.3

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1000.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	625.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	666.7	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	835.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	910.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	769.2	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	482.3	$2.94x10^{-2}$	$8.67x10^{-4}$
u		0.106	
10000 mg ± 0.106			

For uncertainty of endrin in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$100\ ppm\ \pm ? = \frac{(1500\ \text{ppm} \pm 1.46) * (666.7\ mg \pm 0.0294)}{10000\ mg \pm 0.106}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of endrin (group 7)	1500	1.46	$9.47x10^{-7}$	$9.74x10^{-4}$
Amount of endrin	666.7	$2.94x10^{-2}$	$1.95x10^{-9}$	
Solvent	10000	0.106	$1.12x10^{-10}$	
u	100	0.10		
100 ppm ± 0.10				

Table 3.37. Characterization of Aldrin in mixture II of mix A

mix A-mixture II (100 ppm 10000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of groups	9517.7
Weight of solvent	482.3

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1000.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	625.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	666.7	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	835.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	910.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	769.2	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	482.3	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
10000 mg ± 0.106			

For uncertainty of aldrin in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$103\ ppm\ \pm ? = \frac{(1548\ \text{ppm} \pm 2.21) * (666.7\ mg \pm 0.0294)}{10000\ mg \pm 0.106}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of aldrin (group 7)	1548	2.21	$2.04x10^{-6}$	
Amount of aldrin	666.7	$2.94x10^{-2}$	$1.95x10^{-9}$	$1.43x10^{-3}$
Solvent	10000	0.106	$1.12x10^{-10}$	
u	103	0.15		
103 ppm ± 0.15				

Table 3.38. Characterization of 4,4'-DDD in mixture II of mix A

mix A-mixture II (100 ppm 10000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$
Total weight of groups	9517.7
Weight of solvent	482.3

	Value(X)	*u(X)*	
group 4	1000.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	625.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	666.7	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	835.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	910.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	769.2	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	482.3	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
10000 mg ± 0.106			

For uncertainty of 4,4'-DDD in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$100\ ppm\ \pm ? = \frac{(1100\ \text{ppm} \pm 2.90) * (909.1\ mg\ \pm 0.0294)}{10000\ mg\ \pm 0.106}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of 4,4'-DDD (group10)	1100	2.90	$6.95x10^{-6}$	$2.64x10^{-3}$
Amount of 4,4'-DDD	909.1	$2.94x10^{-2}$	$1.05x10^{-9}$	
Solvent	10000	0.106	$1.12x10^{-10}$	
u	100	0.26		
100 ppm ± 0.26				

Table 3.39. Characterization of *gamma*-HCH in mixture II of mix A

mix A-mixture II (100 ppm 10000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of groups	9517.7
Weight of solvent	482.3

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1000.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	625.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	666.7	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	835.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	910.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	769.2	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	482.3	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
10000 mg ± 0.106			

For uncertainty of *gamma*-HCH in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$100\ ppm\ \pm ? = \frac{(1100\ \text{ppm} \pm 2.28) * (909.1\ mg \pm 0.0294)}{10000\ mg \pm 0.106}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of *gamma*-HCH (group 11)	1100	2.28	$4.30x10^{-6}$	$2.07x10^{-3}$
Amount of *gamma*-HCH	909.1	$2.94x10^{-2}$	$1.05x10^{-9}$	
Solvent	10000	0.106	$1.12x10^{-10}$	
u	100	0.21		
100 ppm ± 0.21				

Table 3.40. Characterization of *alpha*-Endosulfan in mixture II of mix A

mix A-mixture II (100 ppm 10000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	2.94x10^{-2}

Total weight of groups	9517.7
Weight of solvent	482.3

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1000.0	2.94x10^{-2}	8.67x10^{-4}
group 5	714.3	2.94x10^{-2}	8.67x10^{-4}
group 6	625.0	2.94x10^{-2}	8.67x10^{-4}
group 7	666.7	2.94x10^{-2}	8.67x10^{-4}
group 8	909.1	2.94x10^{-2}	8.67x10^{-4}
group 9	835.3	2.94x10^{-2}	8.67x10^{-4}
group 10	909.1	2.94x10^{-2}	8.67x10^{-4}
group 11	909.1	2.94x10^{-2}	8.67x10^{-4}
group 12	910.1	2.94x10^{-2}	8.67x10^{-4}
group 13	769.2	2.94x10^{-2}	8.67x10^{-4}
group 14	714.3	2.94x10^{-2}	8.67x10^{-4}
group 15	555.6	2.94x10^{-2}	8.67x10^{-4}
Weight of solvent	482.3	2.94x10^{-2}	8.67x10^{-4}
u	0.106		
10000 mg ± 0.106			

For uncertainty of *alpha*-endosulfan in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1} \quad 101\ ppm\ \pm ? = \frac{(1110\ \text{ppm} \pm 1.10) * (909.1\ mg \pm 0.0294)}{10000\ mg \pm 0.106}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of *alpha*-endosulfan (group11)	1110	1.10	9.82x10^{-7}	9.92x10^{-4}
Amount of *alpha*-endosulfan	909.1	2.94x10^{-2}	1.05x10^{-9}	
Solvent	10000	0.106	1.12x10^{-10}	
u	101	0.10		
101 ppm ± 0.10				

Table 3.41. Characterization of Heptachlor in mixture II of mix A

mix A-mixture II (100 ppm 10000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of groups	9517.7
Weight of solvent	482.3

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1000.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	625.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	666.7	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	835.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	910.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	769.2	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	482.3	$2.94x10^{-2}$	$8.67x10^{-4}$
u		0.106	
10000 mg ± 0.106			

For uncertainty of heptachlor in mixture

C1*W1=C2*W2

$C1 = \frac{C2 * W2}{W1}$ 100 ppm $\pm$? = $\frac{(1100 \text{ ppm} \pm 1.20) * (910.1 mg \pm 0.0294)}{10000\ mg \pm 0.106}$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of heptachlor (group 12)	1100	1.20	$1.19x10^{-6}$	$1.09x10^{-3}$
Amount of heptachlor	910.1	$2.94x10^{-2}$	$1.05x10^{-9}$	
Solvent	10000	0.106	$1.12x10^{-10}$	
u	100	0.11		
100 ppm ± 0.11				

Table 3.42. Characterization of 4,4'-DDT in mixture II of mix A

mix A-mixture II (100 ppm 10000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertatinity	$2.94x10^{-2}$

Total weight of groups	9517.7
Weight of solvent	482.3

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1000.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	625.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	666.7	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	835.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	910.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	769.2	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	482.3	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
10000 mg ± 0.106			

For uncertainty of 4,4'-DDT in mixture

C1*W1=C2*W2

$C1 = \frac{C2 * W2}{W1}$ $103\ ppm\ \pm ? = \frac{(1127\ \text{ppm} \pm 0.85) * (910.1\ mg \pm 0.0294)}{10000\ mg \pm 0.106}$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2 + \ldots [X/u(x)]_n^2}$
Concentration of 4,4'-DDT (group 12)	1127	0.85	$5.69x10^{-7}$	$7.55x10^{-4}$
Amount of 4,4'-DDT	910.1	$2.94x10^{-2}$	$1.05x10^{-9}$	
Solvent	10000	0.106	$1.12x10^{-10}$	
u	103	0.08		
103 ppm ± 0.08				

Table 3.43. Characterization of *alpha*-HCH in mixture II of mix A

mix A-mixture II (100 ppm 10000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertatinity	$2.94x10^{-2}$

Total weight of groups	9517.7
Weight of solvent	482.3

	Value(X)	*u(X)*	
group 4	1000.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	625.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	666.7	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	835.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	910.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	769.2	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	482.3	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
10000 mg ± 0.106			

For uncertainty of *alpha*-HCH in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$100\ ppm\ \pm ? = \frac{(1300\ \text{ppm} \pm 1.01) * (769.2\ mg \pm 0.0294)}{10000\ mg \pm 0.106}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of *alpha*-HCH (group 13)	1300	1.01	$6.04x10^{-7}$	
Amount of *alpha*-HCH	769.2	$2.94x10^{-2}$	$1.46x10^{-9}$	$7.78x10^{-4}$
Solvent	10000	0.106	$1.12x10^{-10}$	
u	100	0.08		
100 ppm ± 0.08				

Table 3.44. Characterization of *beta*-Endosulfan in mixture II of mix A

mix A-mixture II (100 ppm 10000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of groups	9517.7
Weight of solvent	482.3

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1000.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	625.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	666.7	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	835.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	910.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	769.2	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	482.3	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
10000 mg ± 0.106			

For uncertainty of *beta*-endosulfan in mixture

C1*W1=C2*W2

$C1 = \frac{C2 * W2}{W1}$ 100 ppm $\pm$? $= \frac{(1300 \text{ ppm} \pm 1.48) * (769.2\ mg \pm 0.0294)}{10000\ mg \pm 0.106}$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2 + \ldots [X/u(x)]_n^2}$
Concentration of *beta*-endosulfan (group 13)	1300	1.48	$1.30x10^{-6}$	$1.14x10^{-3}$
Amount of *beta*-endosulfan	769.2	$2.94x10^{-2}$	$1.46x10^{-9}$	
Solvent	10000	0.106	$1.12x10^{-10}$	
u	100	0.11		
100 ppm ± 0.11				

Table 3.45. Characterization of 2,4'-DDT in mixture II of mix A

mix A-mixture II (100 ppm 10000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of groups	9517.7
Weight of solvent	482.3

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1000.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	625.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	666.7	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	835.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	910.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	769.2	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	482.3	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
10000 mg ± 0.106			

For uncertainty of 2,4'-DDT in mixture

C1*W1=C2*W2

$C1 = \frac{C2 * W2}{W1}$ $100\ ppm\ \pm ? = \frac{(1800\ \text{ppm} \pm 3.19) * (555.6\ mg\ \pm 0.0294)}{10000\ mg\ \pm 0.106}$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of 2,4'-DDT (group 12)	1800	3.19	$3.14x10^{-6}$	$1.77x10^{-3}$
Amount of 2,4'-DDT	555.6	$2.94x10^{-2}$	$2.81x10^{-9}$	
Solvent	10000	0.106	$1.12x10^{-10}$	
u	100	0.18		
100 ppm ± 0.18				

Table 3.46. Characterization of Dieldrin in mixture II of mix A

mix A-mixture II (100 ppm 10000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of groups	9517.7
Weight of solvent	482.3

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1000.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	625.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	666.7	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	835.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	909.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	910.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	769.2	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	714.3	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	482.3	$2.94x10^{-2}$	$8.67x10^{-4}$
u		0.106	
10000 mg ± 0.106			

For uncertainty of dieldrin in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$101\ ppm\ \pm ? = \frac{(1811\ \text{ppm} \pm 1.56) * (555.6\ mg\ \pm 0.0294)}{10000\ mg\ \pm 0.106}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of dieldrin (group 13)	1811	1.56	$7.42x10^{-7}$	$8.63x10^{-4}$
Amount of dieldrin	555.6	$2.94x10^{-2}$	$2.81x10^{-9}$	
Solvent	10000	0.106	$1.12x10^{-10}$	
u	101	0.09		
101 ppm ± 0.09				

3.1.2 Volumetrically

The uncertainty arising from balance exerts a significant influence on the calculation of uncertainty in characterization. This is due to the fact that pesticides and solvents are organic chemicals. These substances are characterised by their volatility. This inherent volatility introduces an uncertainty, which must be addressed to ensure the accuracy of the study. Furthermore, the reliability of the balance is of critical importance in ensuring the validity of the study. The values of linearity and repeatability of balance were taken from the certificate of balance. In the gravimetric studies, calculations were based on rectangular and triangular distribution.

The mix C was prepared to be around 80 ppm (mg/L). The uncertainty of individual solution, subgroups and mixtures were calculated as given in appendixes 2, 3 and 4. HCB, metolachlor and heptachlor-endo-epoxide in mix C were not calculated in the characterization and other calculations (stability, uncertainty) because the calibration standard mixture used for mix C did not contain HCB, metolachlor and heptachlor-endo-epoxide. The standard uncertainty of characterization of pesticides in mix A, mix B and mix C are given in Table 3.47.

Table 3.47. Standard uncertainty of characterization of pesticides in mix A, mix B and mix C

	mix A	**mix B**	**mix C**
	$\mathbf{u_{(char)}}$	$\mathbf{u_{(char)}}$	$\mathbf{u_{(char)}}$
HCB	0.25	0.25	-
metolachlor	0.01	0.02	-
alpha-HCH	0.08	0.08	1.13
gamma-HCH	0.21	0.21	0.88
aldrin	0.15	0.15	0.92
dieldrin	0.09	0.09	1.07
endrin	0.10	0.11	1.10
4,4'-DDD	0.26	0.26	0.80
4,4'-DDT	0.08	0.08	1.31
2,4'-DDT	0.18	0.18	0.85
alpha-endosulfan	0.10	0.10	1.45
beta-endosulfan	0.11	0.12	1.11
heptachlor	0.11	0.11	1.31
heptachlor -*endo*-epoxide	0.09	0.20	-

3.2 Uncertainty Coming from Purity

The uncertainty of purity was calculated using uncertainty values from the certificate of solid standard pesticide.

As an example, according to certificate of *α*-HCH, its purity value is 99.5% ± 0.5%. The uncertainty coming from purity was calculated as following,

$$u(p)= \frac{0.5/100}{\sqrt{3}} = 0.0029$$

for *α*-HCH.

Table 3.48. The purity values of pesticides taken from their certificates

Name	Value
HCB	99.7% ±0.5%
metolachlor	98.22% ±0.30%
alpha-HCH	99.85% ± 1.01%
gamma-HCH	99.5% ± 0.5%
aldrin	99.0% ± 0.5%
dieldrin	98.4% ± 0.5%
endrin	98.0% ± 0.5%
4,4'-DDD	99.0% ± 0.5%
4,4'-DDT	98.97% ± 0.37%
2,4'-DDT	98.5% ± 0.5%
alpha-endosulfan	99.5% ± 0.5%
beta-endosulfan	99.45% ± 0.30%
heptachlor	99.5% ± 0.5%
heptachlor -*endo*-epoxide	98.7% ± 0.5%

Table 3.49. Results for uncertainty of purity for determined pesticide

Name	u(p)
HCB	0.003
metolachlor	0.002
alpha-HCH	0.003
gamma-HCH	0.002
aldrin	0.003
dieldrin	0.003
endrin	0.003
4,4'-DDD	0.003
4,4'-DDT	0.006
2,4'-DDT	0.003
alpha-endosulfan	0.003
beta-endosulfan	0.002
heptachlor	0.003
heptachlor -*endo*-epoxide	0.003

3.3 Uncertainty of Calibration Curve

The uncertainty of calibration in GC-MS analysis was calculated by using the linear equation. The calibration standards were prepared by using the organochlorine pesticide mix 3, at concentrations 2.0, 3.0, 5.0, 6.0, 8.0, and 10.0 mg kg^{-1} concentrations for gravimetric mix A and mix B and using the same calibration standard mix, at concentrations of 0.50, 1.0, 2.5, 5.0 and 10.0 mg L^{-1} for mix C. The R^2 value of the calibration curves were equal to or greater than 0.998.

The uncertainty of calibration curve was calculated according to equation 2.12 and 2.16. Before each analysis, calibration curve was drawn using by calibration standards. Therefore, each calibration curve was identified at different times (Table 3.50).

In order to find standard deviation of calibration curve (S), the CurveExpert 1.3 program was used. It was found to be 7.90 for calibration curve on 8 May 2023. The calibration curve was created by plotting peak areas against concentrations. The slope of the calibration curve (B_1) was found to be 339.98 (Calibration equation: y = 339.98x-123.8).

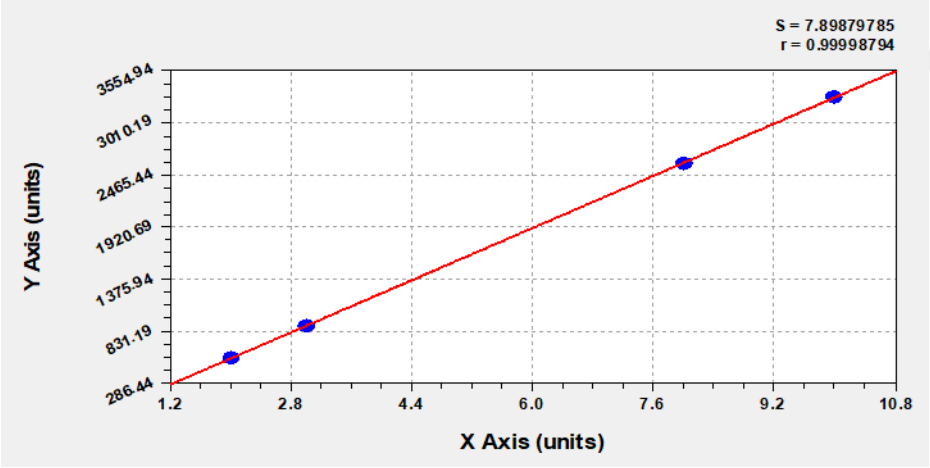


Figure 3.1. Calibration curve for HCB in mixture I of mix A on 8 May 2023

The calibration curve that was used on 8 May 2023 had 2.0, 3.0, 8.0 and 10.0 ppm concentrations. Therefore, n is equal to 4 and p is equal to 1. Sxx and $\bar{C}$ were calculated as 11.3 and as 5.75, respectively. The calculations are shown in Table 3.50.

Table 3.50. Calculation of uncertainty of calibration curve for HCB in mixture I of mix A on 8 May 2023

8.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	11.3
2	558.81	1.64	-4.11	16.9	**C_0 (ppm)**	8
3	895.59	2.63	-3.12	9.7	**C_{ort}**	5.8
8	2.587.42	7.61	1.86	3.5	**S**	7.90
10	3.282.57	9.66	3.91	15.3	**B_1**	339.98
$\bar{C}$=5.75			**S_{xx}**	11.3	**p**	1
					n	4
					u(C_0)	**0.019**

C_0 was taken as 8 ppm;

$$u(C_0) = \frac{7.90}{339.98}\ x\ \sqrt{\frac{1}{1}+\frac{1}{4}+\frac{(8-5.75)}{11.3}} = 0.019 \qquad (3.1)$$

For each group uncertainty of calibration curve was calculated. Finally, the average of uncertainty of calibration curve was taken for calculation of expanded uncertainty. The same calculations were applied to mix B and mix C at -20°C (appendix 4).

3.4 Homogeneity Testing

All samples were diluted with acetonitrile. The analysis was repeated five times. The mixture II of mix A was prepared as 2 ppm to analyse in GC-MS. The calculation of uncertainty of homogeneity was carried out using equations in section 2.9. Further information is given from Table 3.53 to 3.58.

The results of the homogeneity tests were statistically analysed using one-way analysis of variance (ANOVA) at the 95 % confidence level (appendix 5). This homogeneity testing has carried out for gravimetric mix A. According to the ANOVA results, all pesticides, α-HCH, γ-HCH, aldrin, dieldrin, endrin, endosul-

fan-alpha, endosulfan-beta, 4,4'-DDT, 4,4'-DDD, 2,4'-DDT, heptachlor and heptachlor endo-epoxide showed homogeneity based on the F-test ($F<F_{criteria}$). Further information is given in Table 3.52.

The homogeneity test was carried out according to ISO 35-2006: Reference Materials-General and statistical principles for certification for mix A at -20°C (ISO 35, 2006). The mix A were analysed as 5 replicates in one day.

Table 3.51. The results of ANOVA

Name	**F**	**$F_{criteria}$**
alpha-HCH	4.29	5.32
gamma-HCH	0.18	5.32
aldrin	0.46	5.32
dieldrin	0.96	5.32
endrin	0.20	5.32
4,4'-DDD	0.16	5.32
4,4'-DDT	0.81	5.32
2,4'-DDT	0.76	5.32
alpha-endosulfan	2.84	5.32
beta-endosulfan	0.93	5.32
heptachlor	0.08	5.32
heptachlor-*endo*-epoxide	2.01	5.32

Table 3.52. The results of uncertainty of homogeneity for *alpha*-HCH and *gamma*-HCH

***alpha*-HCH in mixture II of mix A**					***gamma*-HCH in mixture II of mix A**				
	First Bottle		**Second Bottle**			**First Bottle**		**Second Bottle**	
Replicate Number	**Concentration (ppm) (X_1)**	**Concentration $(ppm)^2$ (X_1^2)**	**Concentration (ppm) (X_2)**	**Concentration $(ppm)^2$ (X_2^2)**	**Replicate Number**	**Concentration (ppm) (X_1)**	**Concentration $(ppm)^2$ (X_1^2)**	**Concentration (ppm) (X_2)**	**Concentration $(ppm)^2$ (X_2^2)**
1	2.04	4.15	2.01	4.03	1	2.04	4.18	2.05	4.19
2	2.00	4.00	2.05	4.18	2	2.02	4.08	2.05	4.20
3	2.00	3.98	2.04	4.17	3	2.03	4.13	1.99	3.94
4	2.02	4.10	2.09	4.36	4	1.99	3.96	2.02	4.09
5	2.03	4.12	2.07	4.27	5	2.03	4.11	2.03	4.14
ΣX	10.09		10.25		**ΣX**	10.11		10.14	
ΣX^2		20.36		21.02	**ΣX^2**		20.46		20.56
SSwg	0.0049				**SSwg**	0.00434			
SS_{bb}	0.0026				**SS_{bb}**	0.00005			
MS_{wg}	0.0006				**MS_{wg}**	0.00054			
MS_{bb}	0.0026				**MS_{bb}**	0.00005			
u_{bb}	0.0093				**u_{bb}**	0.00876			
s_{bb}	0.0200				**s_{bb}**	-			

Table 3.53. The results of uncertainty of homogeneity for Aldrin and Dieldrin

aldrin in mixture II of mix A					dieldrin in mixture II of mix A				
	First Bottle		Second Bottle			First Bottle		Second Bottle	
Replicate Number	Concentration (ppm) (X_1)	Concentration $(ppm)^2$ (X_1^2)	Concentration (ppm) (X_2)	Concentration $(ppm)^2$ (X_2^2)	Replicate Number	Concentration (ppm) (X_1)	Concentration $(ppm)^2$ (X_1^2)	Concentration (ppm) (X_2)	Concentration $(ppm)^2$ (X_2^2)
1	2.01	4.03	2.03	4.11	1	2.02	4.08	2.08	4.34
2	2.08	4.33	2.02	4.07	2	2.04	4.18	2.06	4.25
3	2.06	4.26	2.06	4.26	3	2.03	4.14	2.09	4.35
4	2.06	4.24	2.03	4.14	4	2.01	4.06	2.02	4.07
5	2.05	4.19	2.06	4.25	5	2.04	4.16	2.00	3.99
ΣX	10.26		10.21		**ΣX**	10.15		10.25	
ΣX^2		21.05		20.83	**ΣX^2**		20.62		21.00
SSwg	0.00476				**SSwg**	0.00707			
SS_{bb}	0.00027				**SS_{bb}**	0.00085			
MS_{wg}	0.00059				**MS_{wg}**	0.00088			
MS_{bb}	0.00027				**MS_{bb}**	0.00085			
u_{bb}	0.00917				**u_{bb}**	0.01118			
s_{bb}	-				**s_{bb}**	-			

Table 3.54. The results of uncertainty of homogeneity for Endrin and 4,4'-DDD

endrin in mixture II of mix A					**4,4'-DDD in mixture II of mix A**				
	First Bottle		**Second Bottle**			**First Bottle**		**Second Bottle**	
Replicate Number	**Concentration (ppm) (X_1)**	**Concentration (ppm)^2 (X_1^2)**	**Concentration (ppm) (X_2)**	**Concentration (ppm)^2 (X_2^2)**	**Replicate Number**	**Concentration (ppm) (X_1)**	**Concentration (ppm)^2 (X_1^2)**	**Concentration (ppm) (X_2)**	**Concentration (ppm)^2 (X_2^2)**
1	2.05	4.20	2.02	4.09	1	2.06	4.25	2.07	4.28
2	1.99	3.95	2.03	4.11	2	2.02	4.09	2.09	4.36
3	2.02	4.07	2.05	4.21	3	2.21	4.89	2.08	4.32
4	2.06	4.23	2.06	4.25	4	2.05	4.19	2.04	4.16
5	2.08	4.32	2.07	4.27	5	2.09	4.37	2.09	4.36
ΣX	10.19		10.23		**ΣX**	10.43		10.36	
ΣX^2		20.76		20.92	**ΣX^2**		21.78		21.48
SSwg	0.00657				**SSwg**	0.02361			
SS_{bb}	0.00016				**SS_{bb}**	0.00046			
MS_{wg}	0.00082				**MS_{wg}**	0.00295			
MS_{bb}	0.00016				**MS_{bb}**	0.00046			
u_{bb}	0.01077				**u_{bb}**	0.02043			
s_{bb}	-				**s_{bb}**	-			

Table 3.55. The results of uncertainty of homogeneity for 4,4'-DDT and 2,4'-DDT

4,4'-DDT in mixture II of mix A					2,4'-DDT in mixture II of mix A				
	First Bottle		Second Bottle			First Bottle		Second Bottle	
Replicate Number	Concentration (ppm) (X_1)	Concentration $(ppm)^2$ (X_1^2)	Concentration (ppm) (X_2)	Concentration $(ppm)^2$ (X_2^2)	Replicate Number	Concentration (ppm) (X_1)	Concentration $(ppm)^2$ (X_1^2)	Concentration (ppm) (X_2)	Concentration $(ppm)^2$ (X_2^2)
1	2.11	4.45	2.11	4.46	1	2.28	5.22	2.26	5.12
2	2.11	4.46	2.27	5.13	2	2.16	4.69	2.23	4.98
3	2.05	4.22	2.07	4.27	3	2.15	4.62	2.23	4.98
4	2.05	4.21	2.07	4.29	4	2.26	5.10	2.27	5.15
5	2.09	4.36	2.08	4.33	5	2.19	4.80	2.19	4.78
ΣX	10.42		10.59		**ΣX**	11.05		11.18	
ΣX^2		21.70		22.47	**ΣX^2**		24.43		25.01
SSwg	0.03160				**SSwg**	0.01831			
SS_{bb}	0.00319				**SS_{bb}**	0.00175			
MS_{wg}	0.00395				**MS_{wg}**	0.00229			
MS_{bb}	0.00319				**MS_{bb}**	0.00175			
u_{bb}	0.02364				**u_{bb}**	0.01799			
s_{bb}	-				**s_{bb}**	-			

Table 3.56. The results of uncertainty of homogeneity for *alpha*-Endosulfan and *beta*-Endosulfan

***alpha*-Endosulfan in mixture II of mix A**					***beta*-Endosulfan in mixture II of mix A**				
	First Bottle		**Second Bottle**			**First Bottle**		**Second Bottle**	
Replicate Number	**Concentration (ppm) (X_1)**	**Concentration $(ppm)^2$ (X_1^2)**	**Concentration (ppm) (X_2)**	**Concentration $(ppm)^2$ (X_2^2)**	**Replicate Number**	**Concentration (ppm) (X_1)**	**Concentration $(ppm)^2$ (X_1^2)**	**Concentration (ppm) (X_2)**	**Concentration $(ppm)^2$ (X_2^2)**
1	2.01	4.04	2.06	4.25	1	2.06	4.23	2.01	4.04
2	1.98	3.91	2.00	3.99	2	2.02	4.07	2.01	4.03
3	1.99	3.96	1.99	3.98	3	2.05	4.20	2.04	4.15
4	1.98	3.91	2.01	4.05	4	2.05	4.21	2.06	4.24
5	2.02	4.09	2.05	4.22	5	2.08	4.31	2.06	4.26
ΣX	9.98		10.12		**ΣX**	10.25		10.18	
ΣX^2		19.91		20.48	**ΣX^2**		21.02		20.72
SSwg	0.00580				**SSwg**	0.00454			
SS_{bb}	0.00206				**SS_{bb}**	0.00053			
MS_{wg}	0.00072				**MS_{wg}**	0.00057			
MS_{bb}	0.00206				**MS_{bb}**	0.00053			
u_{bb}	0.01012				**u_{bb}**	0.00896			
s_{bb}	0.01635				**s_{bb}**	-			

Table 3.57. The results of uncertainty of homogeneity for Heptachlor and Heptachlor-*endo*-epoxide

heptachlor in mixture II of mix A					heptachlor-endo-epoxide in mixture II of mix A				
	First Bottle		Second Bottle			First Bottle		Second Bottle	
Replicate Number	Concentration (ppm) (X_1)	Concentration $(ppm)^2$ (X_1^2)	Concentration (ppm) (X_2)	Concentration $(ppm)^2$ (X_2^2)	Replicate Number	Concentration (ppm) (X_1)	Concentration $(ppm)^2$ (X_1^2)	Concentration (ppm) (X_2)	Concentration $(ppm)^2$ (X_2^2)
1	2.01	4.04	2.05	4.21	1	2.01	4.02	2.05	4.19
2	2.01	4.05	2.04	4.16	2	2.01	4.06	2.00	4.00
3	2.02	4.08	2.07	4.29	3	2.01	4.06	2.07	4.28
4	2.05	4.22	1.92	3.69	4	2.04	4.15	2.05	4.22
5	1.97	3.89	1.94	3.77	5	2.02	4.07	2.01	4.06
ΣX	10.07		10.02		**ΣX**	10.09		10.19	
ΣX^2		20.28		20.11	**ΣX^2**		20.36		20.75
SSwg	0.02204				**SSwg**	0.00367			
SS_{bb}	0.00021				**SS_{bb}**	0.00092			
MS_{wg}	0.00276				**MS_{wg}**	0.00046			
MS_{bb}	0.00021				**MS_{bb}**	0.00092			
u_{bb}	0.01974				**u_{bb}**	0.00806			
s_{bb}	-				**s_{bb}**	0.00965			

As mentioned in section 2.9, if the MS_{bb} is greater than MS_{wg} ($MS_{bb}>MS_{wg}$), u_{bb} or s_{bb} can be chosen as the uncertainty for homogeneity. However, if the MS_{bb} is smaller than MS_{wg} ($MS_{bb}<MS_{wg}$), u_{bb} must be chosen as uncertainty for the homogeneity testing (do Rego, 2017). In this study, u_{bb} was chosen for the calculation of expanded uncertainty except for *alpha*-HCH, *alpha*-endosulfan and heptachlor-*endo*-epoxide.

Table 3.58. The results of homogeneity testing for mix A by gravimetrically

Name	SS_{wg}	SS_{bb}	MS_{wg}	MS_{bb}	u_{bb}	s_{bb}
***alpha*-HCH**	0.005	0.003	0.001	0.003	0.009	0.02
***gamma*-HCH**	0.004	0.000	0.001	0.000	0.009	-
aldrin	0.005	0.000	0.001	0.000	0.009	-
dieldrin	0.007	0.001	0.001	0.001	0.011	-
endrin	0.007	0.000	0.001	0.000	0.011	-
4,4'-DDD	0.024	0.000	0.003	0.000	0.020	-
4,4'-DDT	0.032	0.003	0.004	0.003	0.024	-
2,4'-DDT	0.018	0.002	0.002	0.002	0.018	-
***alpha*-endosulfan**	0.006	0.002	0.001	0.002	0.010	0.02
***beta*-endosulfan**	0.005	0.001	0.001	0.001	0.009	-
heptachlor	0.022	0.000	0.003	0.000	0.020	-
heptachlor-*endo*-epoxide	0.004	0.001	0.000	0.001	0.008	0.01

3.5 Stability Testing

Stability tests were generally carried out for 5 days and 4 months for short- and long- term, respectively. According to ISO 35, the short- and long-term analyses must be at least 3 replicates (ISO 35, 2006). The stability results were obtained from the calculations in sections 3.6.1 and 3.6.2 (appendix 8). The formulas in section 2.0 were applied to calculate on stability uncertainty. Stability test results were evaluated by t-test. n-2 at 95% confidence level.

3.5.1 Short-term Stability

To calculate the short-term uncertainty, *time (t)* must be multiplied by the standard deviation of b_1 ($s(b_1)$). The *t* value was taken as last analysis day. The average day number ($\bar{x}$) was determined according to interval of analysis day. It

is 1 for short term analysis. The slope *($|b_1|$)* is obtained from the figures (appendix 7). If the slope of the graph is less than the $t_{critical}$ value at *n-2*. it means that the pesticide is stable.

3.5.1.1 Stability Testing at -20°C for Mix A, Mix B and Mix C

The short-term stability test was carried out as 4 replicates at approximately 1-week intervals for two bottles of mix A. The short-term stability test was carried out as 3 replicates for one bottle of mix C. In the calculation of stability testing average of day was taken as 7.

The short-term stability test was carried out for 4 replicates except for heptachlor in mix B. All materials determined were found to be stable.

3.5.1.2 Stability Testing at 20°C for Mix A and Mix B

The short-term stability test was carried out for 4 and 5 replicates for HCB, metolachlor, endrin, 2,4'-DDT, *alpha*-endosulfan, heptachlor and heptachlor-*endo*-epoxide and the others, respectively in mix A. However, mix B was analysed for 4 replicates. All materials analysed showed a stable situation.

3.5.1.3 Stability Testing at +4°C for Mix A and Mix B

The short-term stability test was carried out as 4 replicates in both mix A and mix B. All materials determined showed a stable situation.

3.5.2 Long-term Stability

In the long-term stability could just been carried out for gravimetric mix A and mix B at -20°C. To calculate the short-term uncertainty, the *time (t)* must be multiplied by the standard deviation of b_1 *($s(b_1)$)*. The *t* value was taken as last analysis day. The average day number ($\bar{x}$) was determined according to interval of analysis day. It is 30 for long- term analysis. The slope *($|b_1|$)* is obtained from the graph. If the slope of the graph is less than the $t_{critical}$ value at *n-2*, it means that the material is stable.

3.5.2.1 Stability Testing for Mix A and Mix B at -20°C

The long-term stability test was carried out on two bottles for around 5 months, endrin was evaluated as 4 replicates in mix A and mix B. From the table

$t_{critical}$ value was 4.3 for long-term stability at -20°C for both mix A and mix B, heptachlor was evaluated as 3 points and from the table $t_{critical}$ value was 12.7 for mix B in the long-term stability at -20°C. The second bottle of 4,4'-DDT in mix A was subjected to a four-month analysis because it was outside of results for fifth months. Therefore, it was ignored.

Table 3.59. The results of short-term stability for mixture I of mix A at -20°C

Name	**u_{sts}**	**$s(b_1)$**	**$\|b_1\|$**	**$t_{crit.n-2}$ at 95% CL**	**$\|b1\| < t_{crit}.*s(b1)$**
HCB	0.09	$4.00x10^{-3}$	$3.80x10^{-3}$	4.3	stable
metolachlor	0.35	$1.70x10^{-2}$	$7.20x10^{-3}$	4.3	stable

*CL: Confidence level

*t_{crit}: Critical *t* value from the table at certain CL and degrees of freedom

*u_{sts}: Uncertainty of short-term stability

Table 3.60. The results of short-term stability for mixture II of mix A at -20°C

Name	**u_{sts} 1st**	**u_{sts} 2nd**	**$s(b_1)$ 1st**	**$s(b_1)$ 2nd**	**$\|b_1\|$ 1st**	**$\|b_1\|$ 2nd**	**$t_{crit.n-2}$ at 95% CL 1st**	**$t_{crit.n-2}$ at 95% CL 2nd**	**$\|b1\| < t_{crit} * s(b_1)$**
alpha-HCH	0.15	0.28	$7.00x10^{-3}$	$1.34x10^{-2}$	$7.70x10^{-3}$	$5.00x10^{-4}$	$7.70x10^{-3}$	4.3	stable
gamma-HCH	0.05	0.03	$2.30x10^{-3}$	$1.20x10^{-3}$	$4.00x10^{-4}$	$7.00x10^{-4}$	$4.00x10^{-4}$	4.3	stable
aldrin	0.05	0.06	$2.40x10^{-3}$	$3.00x10^{-3}$	$8.00x10^{-4}$	$2.30x10^{-3}$	$8.00x10^{-4}$	4.3	stable
dieldrin	0.09	0.04	$4.20x10^{-3}$	$2.00x10^{-3}$	$6.00x10^{-4}$	$1.00x10^{-3}$	$6.00x10^{-4}$	4.3	stable
endrin	0.02	0.04	$1.20x10^{-3}$	$1.80x10^{-3}$	$1.30x10^{-3}$	$1.00x10^{-5}$	$1.30x10^{-3}$	4.3	stable
4,4'-DDD	0.05	0.04	$2.50x10^{-3}$	$2.00x10^{-3}$	$1.60x10^{-3}$	$9.00x10^{-5}$	$1.60x10^{-3}$	4.3	stable
4,4'-DDT	0.05	0.04	$2.40x10^{-3}$	$1.80x10^{-3}$	$9.00x10^{-4}$	$1.30x10^{-3}$	$9.00x10^{-4}$	4.3	stable
2,4'-DDT	0.13	0.12	$6.20x10^{-3}$	$5.80x10^{-3}$	$3.00x10^{-4}$	$5.90x10^{-3}$	$3.00x10^{-4}$	4.3	stable
alpha-endosulfan	0.04	0.16	$2.10x10^{-3}$	$7.60x10^{-3}$	$1.20x10^{-3}$	$7.10x10^{-3}$	$1.20x10^{-3}$	4.3	stable
beta-endosulfan	0.01	0.12	$6.00x10^{-4}$	$5.50x10^{-3}$	$5.00x10^{-4}$	$4.80x10^{-3}$	$5.00x10^{-4}$	4.3	stable
heptachlor	0.21	0.3	$1.01x10^{-2}$	$1.43x10^{-2}$	$1.08x10^{-2}$	$1.65x10^{-2}$	$1.08x10^{-2}$	4.3	stable
heptachlor-*endo*- epoxide	0.05	0.07	$2.60x10^{-3}$	$3.20x10^{-3}$	$2.20x10^{-3}$	$3.10x10^{-3}$	$2.20x10^{-3}$	4.3	stable

*1st: First bottle

*2nd: Second bottle

*CL: Confidence level

*t_{crit}: Critical *t* value from the table at certain CL and degrees of freedom

*u_{sts}: Uncertainty of short-term stability

Table 3.61. The results of short-term stability for mixture II of mix C at -20°C

Name	$\mathbf{u_{sts}}$	$\mathbf{s(b_1)}$	$\mathbf{\lvert b_1 \rvert}$	$\mathbf{t_{crit.n-2}}$ **at 95% CL**	$\mathbf{\lvert b1 \rvert < t_{crit}.*s(b_1)}$
alpha-HCH	0.41	$4.13x10^{-2}$	$5.40x10^{-3}$	12.7	stable
gamma-HCH	1.25	$1.25x10^{-1}$	$7.00x10^{-4}$	12.7	stable
aldrin	1.85	$1.85x10^{-1}$	$1.60x10^{-2}$	12.7	stable
dieldrin	0.85	$8.54x10^{-2}$	$1.13x10^{-2}$	12.7	stable
endrin	7.41	$7.41x10^{-1}$	$7.07x10^{-2}$	12.7	stable
4,4'-DDD	1.15	$1.16x10^{-1}$	$2.20x10^{-3}$	12.7	stable
4,4'-DDT	1.56	$1.56x10^{-1}$	$1.72x10^{-2}$	12.7	stable
2,4'-DDT	1.73	$1.73x10^{-1}$	$1.93x10^{-2}$	12.7	stable
alpha-endosulfan	0.65	$6.52x10^{-2}$	$8.90x10^{-3}$	12.7	stable
beta-endosulfan	1.40	$1.40x10^{-1}$	$1.95x10^{-2}$	12.7	stable
heptachlor	6.18	$6.18x10^{-1}$	$1.14x10^{-2}$	12.7	stable

*CL: Confidence level

*t_{crit}: Critical *t* value from the table at certain CL and degrees of freedom

*u_{sts}: Uncertainty of short-term stability

Table 3.62. The results of short-term stability for mixture I of mix B at -20°C

Name	**u_{sts}**	**$s(b_1)$**	**$\|b_1\|$**	**$t_{crit.n-2}$ at 95% CL**	**$\|b1\| < t_{crit}.*s(b_1)$**
HCB	0.02	$7.00x10^{-4}$	$9.00x10^{-4}$	4.3	stable
metolachlor	0.32	$1.55x10^{-2}$	$5.60x10^{-3}$	4.3	stable

*CL: Confidence level

*t_{crit}: Critical *t* value from the table at certain CL and degrees of freedom

*u_{sts}: Uncertainty of short-term stability

Table 3.63. The results of short-term stability for mixture II of mix B at -20°C

Name	**usts**	**s(b1)**	**|b1|**	**tcrit.n-2 at 95% CL**	**|b1| < tcrit.*s(b1)**
alpha-HCH	0.11	$5.40x10^{-3}$	$5.00x10^{-3}$	4.3	stable
gamma-HCH	0.10	$4.80x10^{-3}$	$1.12x10^{-2}$	4.3	stable
aldrin	0.19	$9.20x10^{-3}$	$8.90x10^{-3}$	4.3	stable
dieldrin	0.03	$1.30x10^{-3}$	$1.00x10^{-3}$	4.3	stable
endrin	0.02	$9.00x10^{-4}$	$1.10x10^{-3}$	4.3	stable
4,4'-DDD	0.10	$4.80x10^{-3}$	$3.20x10^{-3}$	4.3	stable
4,4'-DDT	0.08	$3.80x10^{-3}$	$4.60x10^{-3}$	4.3	stable
2,4'-DDT	0.02	$1.00x10^{-3}$	$6.00x10^{-4}$	4.3	stable
alpha-endosulfan	0.34	$1.62x10^{-2}$	$1.60x10^{-2}$	4.3	stable
beta-endosulfan	0.19	$9.10x10^{-3}$	$9.10x10^{-3}$	4.3	stable
heptachlor	0.23	$8.90x10^{-3}$	$5.50x10^{-3}$	12.7	stable
heptachlor -*endo*- epoxide	0.05	$2.50x10^{-3}$	$2.90x10^{-3}$	4.3	stable

*CL: Confidence level

*t_{crit}: Critical *t* value from the table at certain CL and degrees of freedom

*u_{sts}: Uncertainty of short-term stability

Table 3.64. The result of short-term stability for mixture I of mix A and mix B at 20°C

	mix A					mix B				
Name	**u_{sts}**	**$s(b_1)$**	**$\|b_1\|$**	**$t_{crit.\ n-2}$ at 95% CL**	**$\|b1\| < t_{crit}*s(b_1)$**	**u_{sts}**	**$s(b_1)$**	**$\|b_1\|$**	**$t_{crit.\ n-2}$ at 95% CL**	**$\|b1\| < t_{crit}*s(b_1)$**
HCB	0.38	0.13	$1.48x10^{-2}$	4.3	stable	0.23	$1.30x10^{-2}$	$5.70x10^{-3}$	4.3	stable
metolachlor	0.25	0.06	$8.49x10^{-2}$	4.3	stable	0.47	$2.60x10^{-2}$	$3.88x10^{-2}$	4.3	stable

*CL: Confidence level

*t_{crit}: Critical *t* value from the table at certain CL and degrees of freedom

*u_{sts}: Uncertainty of short-term stability

Table 3.65. The result of short-term stability for mixture II of mix A and mix B at 20°C

	mix A					mix B				
Name	**u_{sts}**	**$s(b_1)$**	**$\|b_1\|$**	**$t_{crit.\ n-2}$ at 95% CL**	**$\|b1\| < t_{crit}*s(b_1)$**	**u_{sts}**	**$s(b_1)$**	**$\|b_1\|$**	**$t_{crit.\ n-2}$ at 95% CL**	**$\|b1\| < t_{crit}*s(b_1)$**
alpha-HCH	0.03	$7.00x10^{-3}$	$4.00x10^{-3}$	3.18	stable	0.01	$2.80x10^{-3}$	$2.90x10^{-3}$	4.3	stable
gamma-HCH	0.03	$8.00x10^{-3}$	$1.40x10^{-2}$	3.18	stable	0.06	$9.00x10^{-3}$	$2.70x10^{-2}$	4.3	stable
aldrin	0.02	$5.00x10^{-3}$	$8.00x10^{-3}$	3.18	stable	0.07	$4.00x10^{-3}$	$1.00x10^{-3}$	4.3	stable
dieldrin	0.01	$3.00x10^{-3}$	$6.00x10^{-3}$	3.18	stable	0.09	$1.50x10^{-2}$	$2.00x10^{-2}$	4.3	stable
endrin	0.06	$1.90x10^{-2}$	$1.70x10^{-2}$	4.3	stable	0.03	$6.00x10^{-3}$	$8.00x10^{-3}$	4.3	stable
4,4'-DDD	0.05	$1.20x10^{-2}$	$1.40x10^{-2}$	3.18	stable	0.02	$4.00x10^{-3}$	$7.00x10^{-3}$	4.3	stable
4,4'-DDT	0.10	$2.50x10^{-2}$	$8.70x10^{-2}$	3.18	stable	0.09	$1.50x10^{-2}$	$1.10x10^{-2}$	4.3	stable
2,4'-DDT	0.04	$1.20x10^{-2}$	$4.00x10^{-3}$	4.3	stable	0.06	$1.00x10^{-2}$	$2.60x10^{-2}$	4.3	stable
alpha-endosulfan	0.02	$6.00x10^{-3}$	$5.00x10^{-3}$	4.3	stable	0.19	$3.20x10^{-2}$	$8.00x10^{-3}$	4.3	stable
beta-endosulfan	0.04	$1.10x10^{-2}$	$7.00x10^{-3}$	3.18	stable	0.04	$7.00x10^{-3}$	$1.20x10^{-2}$	4.3	stable
heptachlor	0.07	$1.70x10^{-2}$	$4.00x10^{-3}$	4.3	stable	0.03	$4.00x10^{-3}$	$9.00x10^{-3}$	4.3	stable
heptachlor -*endo*- epoxide	0.06	$2.10x10^{-2}$	$2.00x10^{-3}$	4.3	stable	0.07	$1.20x10^{-2}$	$2.00x10^{-2}$	4.3	stable

*CL: Confidence level

*t_{crit}: Critical *t* value from the table at certain CL and degrees of freedom

*u_{sts}: Uncertainty of short-term stability

Table 3.66. The results of short-term stability for mixture I of mix A and mix B at +4°C

	mix A					mix B				
Name	**u_{sts}**	**$s(b_1)$**	**$\|b_1\|$**	**$t_{crit.\ n-2}$ at 95% CL**	**$\|b1\| < t_{crit}*s(b_1)$**	**u_{sts}**	**$s(b_1)$**	**$\|b_1\|$**	**$t_{crit.\ n-2}$ at 95% CL**	**$\|b1\| < t_{crit}*s(b_1)$**
HCB	0.13	$3.30x10^{-2}$	$6.00x10^{-3}$	4.3	stable	0.21	$1.20x10^{-2}$	$5.30x10^{-3}$	4.3	stable
metolachlor	0.37	$6.20x10^{-2}$	$1.00x10^{-2}$	4.3	stable	0.11	$1.80x10^{-2}$	$6.80x10^{-3}$	4.3	stable

*CL: Confidence level

*t_{crit}: Critical *t* value from the table at certain CL and degrees of freedom

*u_{sts}: Uncertainty of short-term stability

Table 3.67. The results of short-term stability for mixture II of mix A and mix B at +4°C

	mix A								mix B				
Name	**$u_{sts\ 1st}$**	**$u_{sts\ 2nd}$**	**$s(b_1)$ 1st**	**$s(b_1)$ 2nd**	**$\|b_1\|$ 1st**	**$\|b_1\|$ 2nd**	**$t_{crit.\ n-2}$ at 95% CL**	**$\|b_1\| < t_{crit}*s(b_1)$**	**u_{sts}**	**$s(b_1)$**	**$\|b_1\|$**	**$t_{crit.\ n-2}$ at 95% CL**	**$\|b_1\| < t_{crit}*s(b_1)$**
alpha-HCH	0.14	0.04	$7.58x10^{-3}$	$1.99x10^{-3}$	$1.40x10^{-2}$	$7.58x10^{-3}$	4.3	stable	0.06	$1.17x10^{-2}$	$5.30x10^{-3}$	4.3	stable
gamma-HCH	0.08	0.08	$4.47x10^{-3}$	$4.42x10^{-3}$	$6.90x10^{-3}$	$4.47x10^{-3}$	4.3	stable	0.06	$1.81x10^{-2}$	$6.80x10^{-3}$	4.3	stable
aldrin	0.12	0.08	$6.82x10^{-3}$	$4.36x10^{-3}$	$9.80x10^{-3}$	$6.82x10^{-3}$	4.3	stable	0.10	$1.51x10^{-2}$	$1.98x10^{-2}$	4.3	stable
dieldrin	0.02	0.07	$1.38x10^{-3}$	$1.73x10^{-2}$	$1.70x10^{-3}$	$1.38x10^{-3}$	4.3	stable	0.04	$1.01x10^{-2}$	$1.28x10^{-2}$	4.3	stable
endrin	0.03	0.26	$1.68x10^{-3}$	$5.20x10^{-2}$	$2.40x10^{-3}$	$1.68x10^{-3}$	4.3	stable	0.02	$5.79x10^{-3}$	$4.70x10^{-3}$	4.3	stable
4,4'-DDD	0.03	0.18	$1.84x10^{-3}$	$4.44x10^{-2}$	$3.70x10^{-3}$	$1.84x10^{-3}$	4.3	stable	0.56	$2.41x10^{-3}$	$3.90x10^{-3}$	4.3	stable
4,4'-DDT	0.88	0.05	$4.91x10^{-2}$	$9.09x10^{-3}$	$8.10x10^{-3}$	$4.91x10^{-2}$	4.3	stable	0.01	$3.47x10^{-3}$	$7.30x10^{-3}$	4.3	stable
2,4'-DDT	0.04	0.07	$2.06x10^{-3}$	$1.10x10^{-2}$	$3.00x10^{-3}$	$2.06x10^{-3}$	4.3	stable	0.03	$3.14x10^{-2}$	$2.40x10^{-3}$	4.3	stable
alpha-endosulfan	0.04	0.05	$2.34x10^{-3}$	$2.60x10^{-3}$	$2.40x10^{-3}$	$2.34x10^{-3}$	4.3	stable	0.04	$2.13x10^{-3}$	$4.00x10^{-4}$	4.3	stable
beta-endosulfan	0.02	0.04	$1.20x10^{-3}$	$9.68x10^{-3}$	$2.10x10^{-3}$	$1.20x10^{-3}$	4.3	stable	0.03	$1.92x10^{-3}$	$2.00x10^{-3}$	4.3	stable
heptachlor	0.01	0.01	$1.91x10^{-3}$	$2.21x10^{-3}$	$1.10x10^{-3}$	$1.91x10^{-3}$	4.3	stable	0.03	$2.37x10^{-3}$	$1.00x10^{-4}$	4.3	stable
heptachlor -*endo*- epoxide	0.01	0.45	$8.06x10^{-4}$	$7.53x10^{-2}$	$2.00x10^{-4}$	$5.80x10^{-4}$	4.3	stable	0.02	$1.88x10^{-3}$	$6.00x10^{-4}$	4.3	stable

*1^{st}: First bottle

*2^{nd}: Second bottle

*CL: Confidence level

*t_{crit}: Critical *t* value from the table at certain CL and degrees of freedom

*u_{sts}: Uncertainty of short-term stability

Table 3.68. The results of long-term stability for mixture I of mix A and mix B at -20°C

	mix A					mix B				
Name	**u_{sts}**	**$s(b_1)$**	**$\|b_1\|$**	**$t_{crit.\ n-2}$ at 95% CL**	**$\|b1\| < t_{crit}*s(b_1)$**	**u_{sts}**	**$s(b_1)$**	**$\|b_1\|$**	**$t_{crit.\ n-2}$ at 95% CL**	**$\|b1\| < t_{crit}*s(b_1)$**
HCB	0.04	$2.66x10^{-4}$	$2.66x10^{-4}$	3.18	stable	0.11	$1.24x10^{-3}$	1.60x10-3	4.3	stable
metolachlor	0.07	$4.40x10^{-4}$	$1.10x10^{-3}$	3.18	stable	0.09	$6.16x10^{-4}$	1.00x10-4	4.3	stable

*CL: Confidence level

*t_{crit}: Critical *t* value from the table at certain CL and degrees of freedom

*u_{sts}: Uncertainty of short-term stability

Table 3.69. The result of long-term stability for mixture II of mix A and mix B at -20°C

	mix A									mix B				
Name	**u_{lts} 1st**	**u_{lts} 2nd**	**s(b_1) 1st**	**s(b_1) 2nd**	**|b_1| 1st**	**|b_1| 2nd**	**$t_{crit.}$ n-2 at 95% CL 1st**	**$t_{crit.}$ n-2 at 95% CL 2nd**	**|b_1|<$t_{crit.}$*s (b_1)**	**u_{lts}**	**s(b_1)**	**|b_1|**	**$t_{crit.}$ n-2 at 95% CL**	**|b_1|<tcrit.* s(b_1)**
alpha-HCH	0.06	0.05	$4.29x10^{-4}$	$3.32x10^{-4}$	$3.00x10^{-4}$	$3.00x10^{-4}$	3.18	3.18	stable	0.06	$1.24x10^{-3}$	$1.60x10^{-3}$	3.18	stable
gamma-HCH	0.15	0.04	$1.03x10^{-3}$	$2.43x10^{-4}$	$1.30x10^{-3}$	$4.00x10^{-7}$	3.18	3.18	stable	0.10	$6.16x10^{-4}$	$1.00x10^{-4}$	3.18	stable
aldrin	0.09	0.04	$5.90x10^{-4}$	$2.94x10^{-4}$	$7.00x10^{-4}$	$3.00x10^{-4}$	3.18	3.18	stable	0.08	$3.77x10^{-4}$	$2.00x10^{-4}$	3.18	stable
dieldrin	0.03	0.03	$2.15x10^{-4}$	$1.75x10^{-4}$	$2.00x10^{-4}$	$3.00x10^{-4}$	3.18	3.18	stable	0.08	$6.43x10^{-4}$	$4.00x10^{-4}$	3.18	stable
endrin	0.16	0.21	$1.76x10^{-3}$	$2.32x10^{-3}$	$2.00x10^{-3}$	$2.00x10^{-3}$	4.3	4.3	stable	0.13	$5.36x10^{-4}$	$7.00x10^{-4}$	3.18	stable
4,4'-DDD	0.17	0.16	$1.15x10^{-3}$	$1.06x10^{-3}$	$1.30x10^{-3}$	$7.00x10^{-4}$	3.18	3.18	stable	0.13	$5.65x10^{-4}$	$1.00x10^{-3}$	3.18	stable
4,4'-DDT	0.22	0.57	$1.44x10^{-3}$	$3.80x10^{-3}$	$1.30x10^{-3}$	$1.90x10^{-3}$	3.18	4.3	stable	0.11	$8.79x10^{-4}$	$7.00x10^{-4}$	4.3	stable
2,4'-DDT	0.19	0.34	$1.23x10^{-3}$	$2.25x10^{-3}$	$3.00x10^{-4}$	$1.80x10^{-3}$	3.18	3.18	stable	0.05	$8.46x10^{-4}$	$1.50x10^{-3}$	4.3	stable
alpha-endosulfan	0.04	0.07	$2.78x10^{-4}$	$4.65x10^{-4}$	$1.00x10^{-5}$	$7.00x10^{-6}$	3.18	3.18	stable	0.16	$7.06x10^{-4}$	$1.90x10^{-3}$	3.18	stable
beta-endosulfan	0.06	0.05	$4.25x10^{-4}$	$3.40x10^{-4}$	$6.00x10^{-5}$	$5.00x10^{-4}$	3.18	3.18	stable	0.07	$3.29x10^{-4}$	$1.00x10^{-3}$	3.18	stable
heptachlor	0.52	0.57	$5.73x10^{-3}$	$6.30x10^{-3}$	$5.00x10^{-3}$	$5.00x10^{-3}$	3.18	3.18	stable	0.04	$1.04x10^{-3}$	$4.00x10^{-4}$	12.7	stable
heptachlor-*endo*-epoxide	0.03	0.03	$1.99x10^{-4}$	$1.95x10^{-4}$	$4.00x10^{-4}$	$2.00x10^{-4}$	3.18	3.18	stable	0.05	$4.33x10^{-4}$	$4.00x10^{-4}$	3.18	stable

*1st: First bottle

*2nd: Second bottle

*CL: Confidence level

*t_{crit}: Critical *t* value from the table at certain CL and degrees of freedom

*u_{lts}: Uncertainty of long-term stability

3.5.3 Expanded Uncertainty Calculation of Each Pesticide

The ISO Guide 30 series specify a coverage factor (k) value of 2 for the expanded uncertainty calculation of each pesticide. The calculation of expanded uncertainty includes the components of homogeneity, stability (short and long term), characterisation, purity, and calibration curve at -20°C for mix A. However, the calculation of expanded uncertainty for mix B includes the components of characterisation, stability (short and long-term), purity and calibration curve at -20°C and the calculation of expanded uncertainty for mix C includes the components of characterisation, calibration curve, stability (short-term), and purity. The uncertainties for each pesticide were calculated using equations 3.1, 3.2 and 3.3 for gravimetrically prepared mix A and mix B and volumetrically prepared mix C, respectively.

$$U = \sqrt{u_{char}{}^2 + u_{bb}{}^2 + u_{wb}{}^2 + u_{sts}{}^2 + u_{lts}{}^2 + u_{cal}{}^2 + u_p{}^2}\ x\ k \qquad (3.1)$$

$$U = \sqrt{u_{char}{}^2 + u_{sts}{}^2 + u_{lts}{}^2 + u_{cal}{}^2 + u_p{}^2}\ x\ k \qquad (3.2)$$

$$U = \sqrt{u_{char}{}^2 + u_{cal}{}^2 + u_{sts}{}^2 + u_p{}^2}\ x\ k \qquad (3.3)$$

4. DISCUSSION

Table 4.1 shows the concentration and expanded uncertainty of each pesticide in the mixture. The gravimetric method has a lower uncertainty than the volumetric method. These results show that gravimetric preparation is the best method as it is a primary method. Heptachlor had the highest expanded uncertainty value in the gravimetrically and volumetrically prepared mix A and C, as it tends to decrease with time. Aldrin, dieldrin, endrin, DDT group and endosulfan group may tend to degrade in GC analysis while still in the injection part according to the EPA 8081b Method (EPA, 2024).

The results showed that the gravimetric method had very low expanded uncertainty compared to the volumetric method. In addition, endrin tends to degrade to endrin aldehyde and endrin ketone (Heijinsdik, 2013) as we had seen the peak of them in the chromatography. Although they were not present in the mixtures, the endrin aldehyde and the endrin ketone were obtained at low concentrations.

The certificate of organochlorine pesticide mixture (Figure 4.1) was produced gravimetrically by Ultra Scientific Analytical Solutions. The certificate sample was obtained from the LGC Company website (LGC Company). A comparison of the expanded uncertainty values of LGC Company with this study, reveals that there is no significant difference. Comparison with CPA Chem's organochlorine pesticide mixture, which was prepared gravimetrically clearly shows that as our mixture (the gravimetric preparation of the mixture is indicated on the certificate), has a lower uncertainty value than CPA Chem's mixture (Figure 4.2). Similarly, when analysing Restek Company's mix (Figure 4.3), it can be seen that our uncertainty values were about 8 times less than the values of Restek Company’s mix. It is imperative to underscore the inherent value of this study. It is demonstrated that, should manufacturing be conducted within our nation, it would be capable of competitiveness within in the global market.

Table 4.1. The expanded uncertainty of each pesticide (k=2, 95% CL)

Name	**mix A (ppm)**	**mix B (ppm)**	**mix C (ppm)**
HCB	100 ± 0.5	100 ± 0.5	-
metolachlor	101 ± 0.7	100 ± 0.7	-
alpha-HCH	100 ± 0.5	100 ± 0.3	79 ± 2.4
gamma-HCH	100 ± 0.5	100 ± 0.5	79 ± 3.1
aldrin	103 ± 0.3	100 ± 0.5	80 ± 4.1
dieldrin	101 ± 0.2	101 ± 0.3	79 ± 2.7
endrin	100 ± 0.4	100 ± 0.4	79 ± 15
4,4'-DDD	100 ± 0.6	100 ± 0.6	78 ± 2.8
4,4'-DDT	103 ± 0.8	101 ± 0.3	81 ± 4.1
2,4'-DDT	100 ± 0.7	100 ± 0.4	79 ± 3.9
alpha-endosulfan	101 ± 0.3	101 ± 0.8	79 ± 3.2
beta-endosulfan	100 ± 0.3	101 ± 0.5	79 ± 3.5
heptachlor	100 ± 1.2	100 ± 0.5	79 ± 12.6
heptachlor -*endo*- epoxide	101 ± 0.5	100 ± 0.4	-



ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

Organochlorine Pesticide Mixture

Product Number PPM-525E **Page:** 1 of 2
Lot Number: CM-1409 **Lot Issue Date:** 26-Mar-2015 **Expiration Date:** 30-Apr-2018

This certified Reference Material (RM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
alachlor	015972-60-8	RM09791	100.3 ± 0.5 µg/mL
aldrin	000309-00-2	RM00635	100.3 ± 0.5 µg/mL
cis-chlordane	005103-71-9	RM07243	100.3 ± 0.5 µg/mL
alpha-BHC	000319-84-6	RM09587	100.1 ± 0.5 µg/mL
atrazine	001912-24-9	RM03843	100.3 ± 0.5 µg/mL
beta-BHC	000319-85-7	RM06986	100.1 ± 0.5 µg/mL
chlorobenzilate	000510-15-6	RM10084	100.2 ± 0.5 µg/mL
chlorothalonil	001897-45-6	RM09468	100.2 ± 0.5 µg/mL
chloroneb	002675-77-6	RM00198	100.3 ± 0.5 µg/mL
DCPA	001861-32-1	RM00201	100.4 ± 0.5 µg/mL
delta-BHC	000319-86-8	RM05696	100.0 ± 0.5 µg/mL
4,4'-DDD	000072-54-8	RM00615	100.2 ± 0.5 µg/mL
4,4'-DDT	000050-29-3	RM06888	100.4 ± 0.5 µg/mL
4,4'-DDE	000072-55-9	RM02891	100.1 ± 0.5 µg/mL
dieldrin	000060-57-1	RM03957	100.1 ± 0.5 µg/mL
endosulfan I	000959-98-8	RM00834	100.1 ± 0.5 µg/mL
endosulfan II	033213-65-9	RM07039	100.4 ± 0.5 µg/mL
endosulfan sulfate	001031-07-8	RM06741	100.0 ± 0.5 µg/mL
endrin	000072-20-8	NT01979	100.2 ± 0.5 µg/mL
endrin aldehyde	007421-93-4	RM04131	100.1 ± 0.5 µg/mL

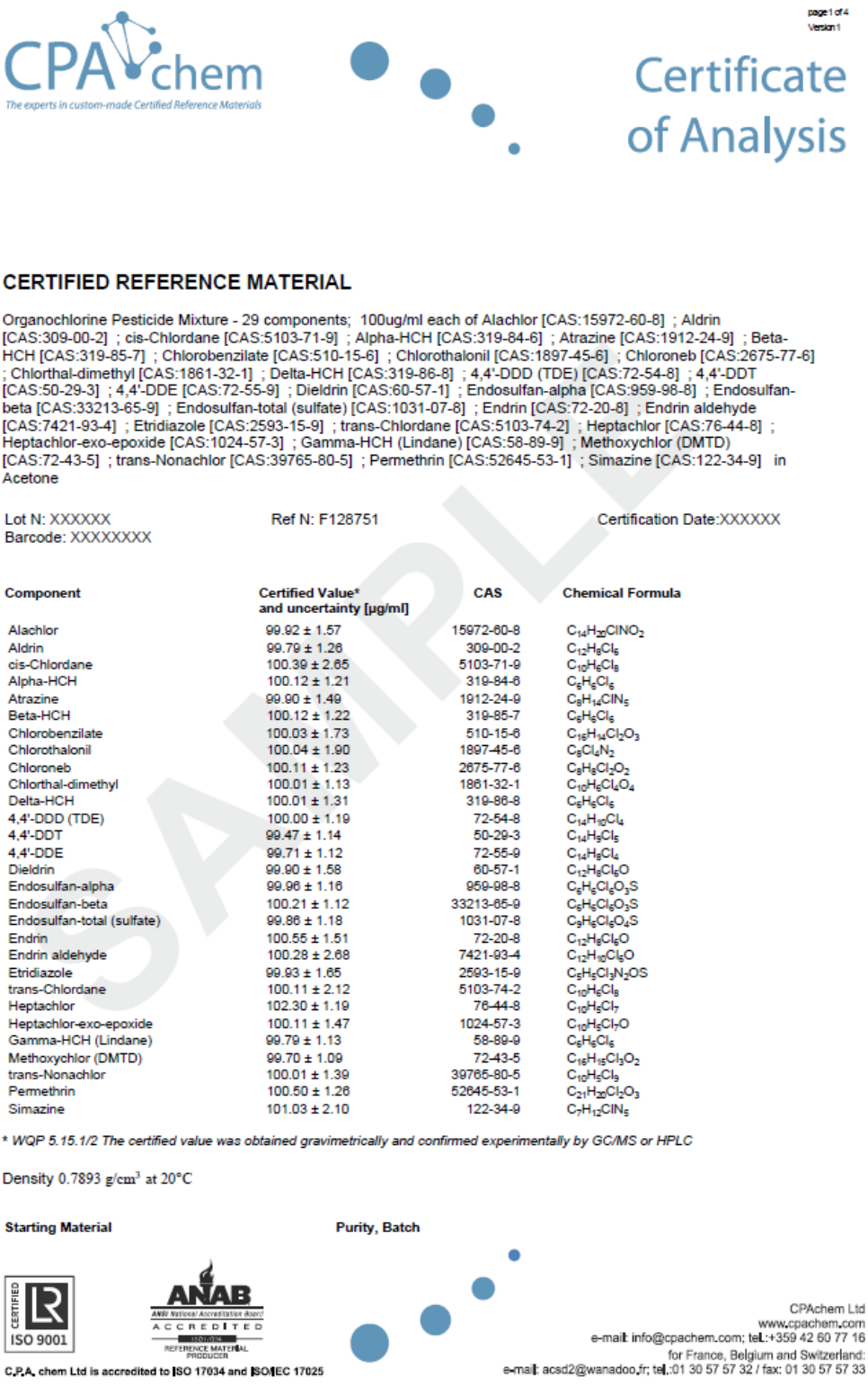
ULTRA uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

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Quality Assurance Manager

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Figure 4.1. A sample certificate of organochlorine pesticide mix from Ultra Scientific



page 1 of 4
Version 1

CPAchem
The experts in custom-made Certified Reference Materials

Certificate of Analysis

CERTIFIED REFERENCE MATERIAL

Organochlorine Pesticide Mixture - 29 components; 100ug/ml each of Alachlor [CAS:15972-60-8] ; Aldrin [CAS:309-00-2] ; cis-Chlordane [CAS:5103-71-9] ; Alpha-HCH [CAS:319-84-6] ; Atrazine [CAS:1912-24-9] ; Beta-HCH [CAS:319-85-7] ; Chlorobenzilate [CAS:510-15-6] ; Chlorothalonil [CAS:1897-45-6] ; Chloroneb [CAS:2675-77-6] ; Chlorthal-dimethyl [CAS:1861-32-1] ; Delta-HCH [CAS:319-86-8] ; 4,4'-DDD (TDE) [CAS:72-54-8] ; 4,4'-DDT [CAS:50-29-3] ; 4,4'-DDE [CAS:72-55-9] ; Dieldrin [CAS:60-57-1] ; Endosulfan-alpha [CAS:959-98-8] ; Endosulfan-beta [CAS:33213-65-9] ; Endosulfan-total (sulfate) [CAS:1031-07-8] ; Endrin [CAS:72-20-8] ; Endrin aldehyde [CAS:7421-93-4] ; Etridiazole [CAS:2593-15-9] ; trans-Chlordane [CAS:5103-74-2] ; Heptachlor [CAS:76-44-8] ; Heptachlor-exo-epoxide [CAS:1024-57-3] ; Gamma-HCH (Lindane) [CAS:58-89-9] ; Methoxychlor (DMTD) [CAS:72-43-5] ; trans-Nonachlor [CAS:39765-80-5] ; Permethrin [CAS:52645-53-1] ; Simazine [CAS:122-34-9] in Acetone

Lot N: XXXXXX
Barcode: XXXXXXXX

Ref N: F128751

Certification Date:XXXXXX

Component	Certified Value* and uncertainty [µg/ml]	CAS	Chemical Formula
Alachlor	99.92 ± 1.57	15972-60-8	$C_{14}H_{20}ClNO_2$
Aldrin	99.79 ± 1.26	309-00-2	$C_{12}H_8Cl_6$
cis-Chlordane	100.39 ± 2.65	5103-71-9	$C_{10}H_6Cl_8$
Alpha-HCH	100.12 ± 1.21	319-84-6	$C_6H_6Cl_6$
Atrazine	99.90 ± 1.49	1912-24-9	$C_8H_{14}ClN_5$
Beta-HCH	100.12 ± 1.22	319-85-7	$C_6H_6Cl_6$
Chlorobenzilate	100.03 ± 1.73	510-15-6	$C_{16}H_{14}Cl_2O_3$
Chlorothalonil	100.04 ± 1.90	1897-45-6	$C_8Cl_4N_2$
Chloroneb	100.11 ± 1.23	2675-77-6	$C_8H_8Cl_2O_2$
Chlorthal-dimethyl	100.01 ± 1.13	1861-32-1	$C_{10}H_6Cl_4O_4$
Delta-HCH	100.01 ± 1.31	319-86-8	$C_6H_6Cl_6$
4,4'-DDD (TDE)	100.00 ± 1.19	72-54-8	$C_{14}H_{10}Cl_4$
4,4'-DDT	99.47 ± 1.14	50-29-3	$C_{14}H_9Cl_5$
4,4'-DDE	99.71 ± 1.12	72-55-9	$C_{14}H_8Cl_4$
Dieldrin	99.90 ± 1.58	60-57-1	$C_{12}H_8Cl_6O$
Endosulfan-alpha	99.96 ± 1.16	959-98-8	$C_9H_6Cl_6O_3S$
Endosulfan-beta	100.21 ± 1.12	33213-65-9	$C_9H_6Cl_6O_3S$
Endosulfan-total (sulfate)	99.86 ± 1.18	1031-07-8	$C_9H_6Cl_6O_4S$
Endrin	100.55 ± 1.51	72-20-8	$C_{12}H_8Cl_6O$
Endrin aldehyde	100.28 ± 2.68	7421-93-4	$C_{12}H_{10}Cl_6O$
Etridiazole	99.93 ± 1.65	2593-15-9	$C_5H_5Cl_3N_2OS$
trans-Chlordane	100.11 ± 2.12	5103-74-2	$C_{10}H_6Cl_8$
Heptachlor	102.30 ± 1.19	76-44-8	$C_{10}H_5Cl_7$
Heptachlor-exo-epoxide	100.11 ± 1.47	1024-57-3	$C_{10}H_5Cl_7O$
Gamma-HCH (Lindane)	99.79 ± 1.13	58-89-9	$C_6H_6Cl_6$
Methoxychlor (DMTD)	99.70 ± 1.09	72-43-5	$C_{16}H_{15}Cl_3O_2$
trans-Nonachlor	100.01 ± 1.39	39765-80-5	$C_{10}H_5Cl_9$
Permethrin	100.50 ± 1.26	52645-53-1	$C_{21}H_{20}Cl_2O_3$
Simazine	101.03 ± 2.10	122-34-9	$C_7H_{12}ClN_5$

** WQP 5.15.1/2 The certified value was obtained gravimetrically and confirmed experimentally by GC/MS or HPLC*

Density 0.7893 g/cm^3 at 20°C

Starting Material

Purity, Batch

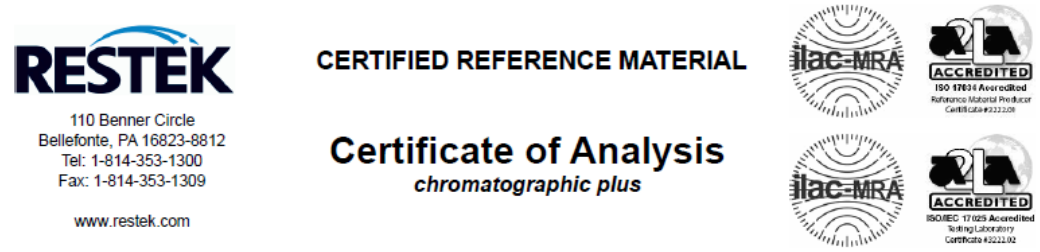
CERTIFIED ISO 9001

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

C.P.A. chem Ltd is accredited to ISO 17034 and ISO/IEC 17025

CPAchem Ltd
www.cpachem.com
e-mail: info@cpachem.com; tel.:+359 42 60 77 16
for France, Belgium and Switzerland:
e-mail: acsd2@wanadoo.fr; tel.:01 30 57 57 32 / fax: 01 30 57 57 33

Figure 4.2. A sample certificate of organochlorine pesticide mix from CPA Chem



RESTEK

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

chromatographic plus

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 32564 **Lot No.:** A0216656

Description : GC Multiresidue Pesticide Std #2 -OCP

GC Multiresidue Pesticide Std #2 -OCP 100µg/mL, Toluene, 1mL/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : September 30, 2026 **Storage:** 10°C or colder

Handling: Sonicate prior to use. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	Chloroneb	2675-77-6	14783700	99%	100.5 µg/mL	+/- 4.5090
2	Pentachlorobenzene	608-93-5	MKCD4132	99%	100.5 µg/mL	+/- 4.5090
3	alpha-BHC	319-84-6	15418900	99%	100.5 µg/mL	+/- 4.5090
4	Hexachlorobenzene	118-74-1	15566500	99%	101.0 µg/mL	+/- 4.5315
5	Pentachloroanisole	1825-21-4	15022000	97%	100.4 µg/mL	+/- 4.5043
6	beta-BHC	319-85-7	BCCC6425	99%	101.0 µg/mL	+/- 4.5315
7	gamma-BHC (Lindane)	58-89-9	14931300	97%	100.4 µg/mL	+/- 4.5043
8	delta-BHC	319-86-8	G1481899	99%	100.5 µg/mL	+/- 4.5090
9	Endosulfan ether	3369-52-6	14379300	99%	100.5 µg/mL	+/- 4.5090
10	Heptachlor	76-44-8	826398	99%	100.0 µg/mL	+/- 4.4866
11	Pentachlorothioanisole	1825-19-0	FCZ01	99%	101.0 µg/mL	+/- 4.5315
12	Aldrin	309-00-2	15537000	98%	100.5 µg/mL	+/- 4.5068
13	4,4'-Dichlorobenzophenone	90-98-2	14805200	99%	101.0 µg/mL	+/- 4.5315
14	Fenson	80-38-6	12828900	99%	100.5 µg/mL	+/- 4.5090
15	Isodrin	465-73-6	15268100	98%	100.0 µg/mL	+/- 4.4848
16	Heptachlor epoxide (isomer B)	1024-57-3	15620200	98%	100.9 µg/mL	+/- 4.5288
17	Chlorbenside	103-17-3	13414000	99%	100.5 µg/mL	+/- 4.5090

Figure 4.3. A sample certificate of organochlorine pesticide mix from Restek

18	trans-Chlordane	5103-74-2	36087	99%	101.0	µg/mL	+/- 4.5315
19	2,4'-DDE	3424-82-6	15346700	99%	101.0	µg/mL	+/- 4.5315
20	Endosulfan I	959-98-8	BCCF4060	99%	100.5	µg/mL	+/- 4.5090
21	cis-Chlordane	5103-71-9	31707	99%	100.5	µg/mL	+/- 4.5090
22	trans-Nonachlor	39765-80-5	050614DT-02	98%	100.9	µg/mL	+/- 4.5288
23	Chlorfenson (Ovex)	80-33-1	337-121B	99%	100.5	µg/mL	+/- 4.5090
24	Dieldrin	60-57-1	15613000	98%	100.0	µg/mL	+/- 4.4848
25	4,4'-DDE	72-55-9	GHYQG	99%	100.0	µg/mL	+/- 4.4866
26	2,4'-DDD	53-19-0	BCCF3012	99%	100.5	µg/mL	+/- 4.5090
27	Endrin	72-20-8	15620400	98%	100.5	µg/mL	+/- 4.5068
28	Ethylan (Perthane)	72-56-0	15397200	97%	99.9	µg/mL	+/- 4.4826
29	Endosulfan II	33213-65-9	15243600	99%	100.5	µg/mL	+/- 4.5090
30	4,4'-DDD	72-54-8	HAN02	99%	100.5	µg/mL	+/- 4.5090
31	2,4'-DDT	789-02-6	15510800	99%	100.5	µg/mL	+/- 4.5090
32	cis-Nonachlor	5103-73-1	MAR-21985-83	99%	100.0	µg/mL	+/- 4.4866
33	Endrin aldehyde	7421-93-4	35886	98%	100.5	µg/mL	+/- 4.5068
34	4,4'-Methoxychlor olefin	2132-70-9	13342700	97%	99.9	µg/mL	+/- 4.4826
35	Endosulfan sulfate	1031-07-8	BCCK8920	99%	101.0	µg/mL	+/- 4.5315
36	4,4'-DDT	50-29-3	S240530RSR	97%	99.9	µg/mL	+/- 4.4826
37	2,4'-Methoxychlor	30667-99-3	14378300	99%	101.0	µg/mL	+/- 4.5315
38	Endrin ketone	53494-70-5	15075900	99%	100.5	µg/mL	+/- 4.5090
39	Tetradifon	116-29-0	12195100	99%	100.5	µg/mL	+/- 4.5090
40	Mirex	2385-85-5	15509100	99%	100.5	µg/mL	+/- 4.5090

* Expanded Uncertainty displayed in same units as Grav. Conc.

Solvent: Toluene
CAS # 108-88-3
Purity 99%

Figure 4.3 (continued). A sample certificate of organochlorine pesticide mix from Restek

5. CONCLUSION

The reference material pesticide mixtures were gravimetrically prepared as mix A and mix B including 14 pesticides. The gravimetrically prepared mix A could only be divided into two bottles. 14 organochlorine pesticides were determined by GC analysis. The mixtures in gravimetric method were analysed at different temperatures as -20°C. 20°C and +4°C. At each temperature, the stability analysis was carried out in the short-term however the long-term stability could only be carried out at -20°C. The most stable results were observed at -20°C while the most variable results were observed at 20°C. In July, all pesticides were exhibited a low concentration due to hot weather conditions. The hot weather can affect to instrument signals and analyte integrity. The homogeneity was tested using ANOVA for gravimetrically prepared mix A. The standard uncertainty coming from characterisation, purity and calibration curve was calculated for each pesticide in each mixture. The expanded uncertainty was calculated by taking k=2 (95% Confidence Level). It has been established that uncertainties derived from instrumental signal fluctuations contribute approximately 10% to the overall expanded uncertainty. This cannot be ignored for the calculation of expanded uncertainty.

In the next phase of this study, it is planned to prepare a CRM mixture containing a tomato matrix for pesticide analysis, with the aim of marketing it both in Türkiye and abroad. This study is an important step towards developing national reference materials for pesticide analysis in Türkiye. The reliable and accurate detection of pesticide residues is of critical importance for both food safety and international trade. In this context, the development of national reference materials will enable analysis laboratories to access reliable resources more easily, while also increasing Türkiye's production capacity in this field, reducing dependency on imports, and strengthening export potential. Therefore, this study provides a strategic contribution not only in scientific terms but also in sectoral and economic aspects.

REFERENCES

Abubakar. Y.. Tijjani. H.. Egbuna. C.. Adetunji. C. O.. Kala. S.. Kryeziu. T. L.. ... & Patrick-Iwuanyanwu. K. C. (2020). Pesticides. history. and classification. In *Natural remedies for pest. disease and weed control* (pp. 29-42). Academic Press.

Afful S. Anim A. Serfor-Armah Y (2010) Spectrum of organochlorine pesticide residues in fish samples from the Densu Basin. Res J Environ Earth Sci 2(3):133–138

Casida. J. E.. & Quistad. G. B. (1998). Pyrethrum flowers and pyrethroid insecticides. *Environmental Health Perspectives*. 106(3). 445–452. https://doi.org/10.1289/ehp.98106445 (accessed 24 February 2025)

Chandra. R.. Sharpanabharathi. N.. Prusty. B.A.K. *et al.* Organochlorine pesticide residues in plants and their possible ecotoxicological and agri food impacts. *Sci Rep* **11**. 17841 (2021). https://doi.org/10.1038/s41598-021-97286-4

Chaturvedi. D. (2012). Perspectives on the synthesis of organic carbamates. *Tetrahedron*. *68*(1). 15-45.

CPA Chem. Organo chlorine pesticide mixture- 29 componets. https://www.cpachem.com/shop/a/112447/f128751 (accessed 3 March 2025)

Delen. N.. Durmuşoğlu. E.. Güncan. A.. Güngör. N.. Turgut. C.. & Burçak. A. (2005). Türkiye'de Pestisit Kullanimi. Kalinti ve Organizmalarda Duyarlilik Azalişi Sorunlari. *Türkiye Ziraat Mühendisligi*. *6*. 3-7.

do Rego. E. C. P.. de Freitas Guimarães. E.. Rodrigues. J. M.. Scarlato. R. C.. Nogueira. R. I.. & Netto. A. D. P. (2017). Feasibility study for development of candidate reference material for food analysis: Chloramphenicol in milk powder. Measurement. 98. 300-304.

Emons. H.. Fajgelj. A.. van der Veen. A. M. H.. & Watters. R. (2006). New definitions on reference materials. Accreditation and Quality Assurance. 10(10). 576–578. doi:10.1007/s00769-006-0089-9

EPA (U.S. Environmental Protection Agency). 2024. *Why we use pesticide?* https://www.epa.gov/safepestcontrol/why-we-use-pesticides. (accessed 10 May 2024)

EPA (U.S. Environmental Protection Agency). *Restricted use pesticides 40 CFR 152.175: Pesticides classified for restricted use.* https://cdxapps.epa.gov/oms-substance-registry-services/substance-list-details/385 (accessed 24 February 2025)

EPA (U.S. Environmental Protection Agency). (2022). *Pesticide toxicology and exposure*. https://www.epa.gov/pesticides (accessed 18 April 2025)

EPA (U.S. Environmental Protection Agency). (2021). *Pesticide environmental effects*. https://www.epa.gov/pesticides (accessed 18 April 2025)

Heijnsdijk. P.. (2013). endrin and DDT Breakdown Evaluation Using an Agilent Inert Flow Path Solution. https://www.agilent.com/Library/applications/5991-1862EN.pdf (accessed 08 June 2024)

Https-1, Statistics for the Behavioral Sciences; https://www.palomar.edu/users/rmorrissette/Lectures/Stats/OneWayANOVA/OneWayANOVA.htm#:~:text=The%20formula%20reads%3A%20Mean%20Squares,freedom%20of%20the%20between%20group.&text=The%20formula%20reads%3A%20Mean%20Squares%20of%20the%20within%20group%20equals,freedom%20of%20the%20within%20group (accessed 19 May 2024)

International Atomic Energy Agency (IAEA), Development and use of reference materials and quality control materials (2003). Available from: https://www-pub.iaea.org/MTCD/publications/PDF/te_1350_web.pdf (accessed 10 May 2024)

ISO Guide 35. Reference Material-General and Statistical Principles for Certification. International Organization for Standardization. Geneva. Switzerland. 2006.

Jantunen. L. M.. & Bidleman. T. F. (1998). Organochlorine pesticides and enantiomers of chiral pesticides in Arctic Ocean water. *Archives of environmental contamination and toxicology*. *35*(2). 218–228. https://doi.org/10.1007/s002449900370

Jokanović M. (2018). Neurotoxic Effects Of Organophosphorus Pesticides And Possible Association With Neurodegenerative Diseases In Man:A review. *Toxicology*. *410*. 125–131. https://doi.org/10.1016/j.tox.2018.09.009

Kanja. L. W.. Skaare. J. U.. Ojwang. S. B. O.. & Maitai. C. K. (1992). A comparison of organochlorine pesticide residues in maternal adipose tissue. maternal blood. cord blood. and human milk from mother/infant pairs. Archives of Environmental Contamination and Toxicology. 22. 21-24.

Karadeniz. H.. & Yenisoy-Karakaş. S. (2015). Spatial distributions and seasonal variations of organochlorine pesticides in water and soil samples in Bolu. Türkiye. Environmental monitoring and assessment. 187. 1-12.

Kaur R. Mavi GK. Raghav S. Khan I. (2019). Pesticides Classification and its Impact on Environment. International Journal of Current Microbiology and Applied Sciences. Mar 10;8(03):1889–97.

LGC Company. Certficate of Analysis Organochlorine Pesticide Mixture. https://assets.lgcstandards.com/sysmaster%2Fpdfs%2Fhd3%2Fh23%2F10136995463198%2FCOA_U-PPM-525E_ST-WB-CERT-2007749-1-1-1.PDF (accessed 20 February 2025)

Martyniuk. C. J.. Mehinto. A. C.. & Denslow. N. D. (2020). Organochlorine pesticides: Agrochemicals with potent endocrine-disrupting properties in fish. *Molecular and cellular endocrinology*. *507*. 110764. https://doi.org/10.1016/j.mce.2020.110764

Otacı. C.. & Güvener. A. (1959). Hexachlorbenzenle İlaçlanmış Tohumluk Buğdaylarda Hexachlorbenzen Tayini. *Bit. Kor. Bül*. *1*(2). 26-29.

Pesticide Action Network European (PAN). *What Substances Are banned And Authorised In The EUMarket?*https://www.paneurope.info/old/Archive/About%20pesticides/banned%20and%20authorised.htm(accessed 24 February 2025).

Panuwet. P.. Prapamontol. T.. Chantara. S.. & Barr. D. B. (2009). Urinary pesticide metabolites in school students from northern Thailand. International journal of hygiene and environmental health. 212(3). 288-297.

Popescu. I. L.. Tanase. I. G.. & Aboul-Enein. H. Y. (2002). The role of reference materials and equipment qualification in method validation. Analytical letters. 35(7). 1107-11

Restek. GC Multiresidue pesticide standard #2 organochlorine compunds, 100 ug/mL, tolüene, 1 mL/ampul. https://www.restek.com/global/en/p/32564 (accessed 3 March 2025)

Siberman. J & Taylor A. (2023). *Carbamate Toxicity*. National Library of Medicine (NIH). https://www.ncbi.nlm.nih.gov/books/NBK482183/ (accessed 24 February 2025)

Serpil Yenisoy-Karakaş. (2006). *Validation and uncertainty assessment of rapid extraction and clean-up methods for the determination of 16 organochlorine pesticide residues in vegetables. , 571(2), 298–307.* doi:10.1016/j.aca.2006.04.082

T.C. Tarım ve Orman Bakanlığı Gıda ve Kontrol Genel Müdürlüğü (2025a). Resmi Tarımsal İlaç İstatistikleri. https://www.tarimorman.gov.tr/GKGM/Menu/115/Resmi-Tarimsal-Ilac-Istatistikleri (accessed 24 February 2025).

T.C. Tarım ve Orman Bakanlığı Gıda ve Kontrol Genel Müdürlüğü Bitki Koruma Ürünler Daire Başkanlığı (2025b). *Bitki Koruma Ürünleri Veri Tabanı Yasaklı veya Kısıtlı Aktif Maddeler Listesi.* https://bku.tarimorman.gov.tr/AktifMadde/YasakliKisitliExcelFileList (accessed 24 February 2025)

Tiryaki. O. (2016). Türkiye'de yapılan pestisit kalıntı analiz ve çalışmaları. Erciyes Üniversitesi Fen Bilimleri Enstitüsü Fen Bilimleri Dergisi. 32(1). 72-80.

World Health Organization. (1986). *Carbamate Pesticides: A General Introduction (EHC 64)*. World Health Organization.https://apps.who.int/iris/bitstream/handle/10665/38687/9241542640-eng.pdf (accessed 24 February 2025).

World Health Organization. (2019). *The WHO recommended classification of pesticides by hazard and guidelines to classification*. https://www.who.int/publications-detail-redirect/9789240005662 (accessed 18 April 2025)

APPENDICES

APPENDIX 1 Banned Pesticides in Türkiye

Table 0.1. Banned pesticides whose import, manufacture and use have been terminated in Türkiye (T.R. Ministry of Agriculture and Forestry, 2025b)

No	Name	Import Termination Date	Production Termination Date	Usage Termination Date
1	1.3-Dıchloropropene	31.12.2008	31.12.2008	31.12.2010
2	4-CPA (4-Chlorophenoxy Acetıc Acıde)	31.08.2009	31.08.2009	31.08.2011
3	acephate	30.06.2010	30.06.2010	31.08.2011
4	acetochlor	01.01.2013	01.01.2013	31.12.2014
5	alachlor	31.12.2008	31.12.2008	31.12.2010
6	aldıcarb	31.12.2008	31.12.2008	31.12.2010
7	amıno acıde	31.08.2009	31.08.2009	31.08.2011
8	amıno acıds: mix	31.12.2008	31.12.2008	31.12.2010
9	amınotrıazole	30.06.2020	31.07.2020	31.12.2020
10	amıtraz	31.12.2008	31.12.2008	31.12.2010
11	ammonıum thıocyanate	31.08.2009	31.08.2009	31.08.2011
12	anılofos	30.06.2010	30.06.2010	31.08.2011
13	atca	31.08.2009	31.08.2009	31.08.2011
14	atrazıne	31.08.2009	31.08.2009	31.08.2011
15	azınphos-methyl	31.08.2009	31.08.2009	31.08.2011
16	azocyclotın	31.08.2009	31.08.2009	31.08.2011
17	benfuracarb	30.06.2011	30.06.2011	31.08.2012
18	benomyl	30.06.2010	30.06.2010	31.08.2011
19	beta cypermethrın	31.12.2008	31.12.2008	31.12.2010
20	bıfenthrın	31.08.2020	15.10.2020	30.09.2021
21	bıtertanol	30.06.2011	30.06.2011	31.08.2012
22	bnoa (beta naphthoxy acetıc acıde)	31.08.2009	31.08.2009	31.08.2011
23	brodıfacoum	30.06.2011	30.06.2011	31.08.2012
24	bromacıl	31.12.2008	31.12.2008	31.12.2010
25	bromophos	31.12.2008	31.12.2008	31.12.2010
26	bromophos-ethyl	31.12.2008	31.12.2008	31.12.2010
27	bromopropylate	30.06.2010	30.06.2010	31.08.2011
28	bronopol	31.12.2008	31.12.2008	31.12.2010
29	butralın	31.08.2009	31.08.2009	31.08.2011
30	cadusafos (aka ebufos)	01.01.2013	01.01.2013	31.12.2014
31	carbaryl	31.08.2009	31.08.2009	31.08.2011
32	carbendazım	23.06.2017	23.06.2017	01.01.2018
33	carbofuran	30.06.2011	30.06.2011	31.08.2012
34	carbosulfan	31.08.2009	31.08.2009	31.08.2011
35	chınomethıonat (aka quınomethıonate)	31.12.2008	31.12.2008	31.12.2010
36	chlorfenapyr	31.12.2008	31.12.2008	31.12.2010
37	chlorfenvınphos	31.12.2008	31.12.2008	31.12.2010
38	chlorfluazuron	30.06.2010	30.06.2010	31.08.2011
39	chlorıdazon	30.09.2020	01.01.2023	30.09.2023
40	chloroneb	31.08.2009	31.08.2009	31.08.2011
41	chloropıcrın	01.01.2013	01.01.2013	31.12.2014
42	chlorothalonıl	31.12.2020	15.02.2021	31.12.2021
43	chlorpropham	30.09.2020	31.10.2020	31.12.2022
44	chlorpyrıfos ethyl	08.04.2016	30.04.2016	21.05.2020
45	chlorpyrıfos methyl	31.10.2020	31.11.2020	31.12.2021
46	cıs-zeatın	31.08.2009	31.08.2009	31.08.2011
47	clothıanıdın	07.01.2019	07.01.2019	31.07.2019
48	coumachlor	30.06.2010	30.06.2010	31.08.2011
49	cyanazıne	31.12.2008	31.12.2008	31.12.2010

Table 0. 1 (continued). Banned pesticides whose import, manufacture and use have been terminated in Türkiye (T.R. Ministry of Agriculture and Forestry, 2025b)

Nu	Name	Import Termination Date	Production Termination Date	Usage Termination Date
50	cyanıdes: calcıum. hydrogen. sodıum	31.12.2008	31.12.2008	31.12.2010
51	cycloate	30.06.2011	30.06.2011	31.08.2012
52	cyclosulfamuron	31.08.2009	31.08.2009	31.08.2011
53	cyfluthrın	31.08.2020	15.10.2020	30.09.2021
54	cyhexatın	30.06.2010	30.06.2010	31.08.2011
55	desmedıpham	30.09.2020	31.10.2020	01.08.2023
56	dıafenthıuron	30.06.2010	30.06.2010	31.08.2011
57	dıazınon	31.08.2009	31.08.2009	31.08.2011
58	dıchlofluanıd	31.12.2008	31.12.2008	31.12.2010
59	dıchlorvos (ddvp)	31.08.2009	31.08.2009	31.08.2011
60	dıcofol	30.06.2010	30.06.2010	31.08.2011
61	dıfenacoum	30.06.2020	31.07.2020	31.12.2020
62	dıfenzoquat	31.12.2008	31.12.2008	31.12.2010
63	dımethenamıd	31.12.2008	31.12.2008	31.12.2010
64	dımethıpın	31.12.2008	31.12.2008	31.12.2010
65	dımethoate	30.09.2020	31.10.2020	01.08.2023
66	dınıconazole m	31.08.2012	31.08.2012	30.06.2013
67	dınocap	31.08.2012	31.08.2012	30.06.2013
68	dıoxacarb	30.06.2010	30.06.2010	31.08.2011
69	dıoxathıon	31.12.2008	31.12.2008	31.12.2010
70	dıphenamıd	30.06.2010	30.06.2010	31.08.2011
71	dnoc	31.08.2012	31.08.2012	30.06.2013
72	endosulfan	31.12.2008	31.12.2008	31.12.2010
73	endothal	31.12.2008	31.12.2008	31.12.2010
74	epn	31.08.2009	31.08.2009	31.08.2011
75	eptc (ethyl dıpropylthıocarbamate)	31.12.2008	31.12.2008	31.12.2010
76	esbıothrın (bıoallethrın)	31.08.2009	31.08.2009	31.08.2011
77	ethalfluralın	30.06.2011	30.06.2011	31.08.2012
78	ethıofencarb	31.12.2008	31.12.2008	31.12.2010
79	ethıon (aka dıethıon)	31.12.2008	31.12.2008	31.12.2010
80	ethırımol	31.12.2008	31.12.2008	31.12.2010
81	ethoate methyl	31.12.2008	31.12.2008	31.12.2010
82	ethoprophos	30.09.2020	31.10.2020	01.08.2023
83	ethoxysulfuron	31.12.2020	31.01.2021	31.12.2021
84	fenamıdone	31.08.2020	15.10.2020	30.09.2021
85	fenarımol	30.06.2010	30.06.2010	31.08.2011
86	fenbutatın oksıt	31.08.2020	15.10.2020	30.09.2021
87	fenıtrothıon	31.08.2009	31.08.2009	31.08.2011
88	fenpıclonıl	31.12.2008	31.12.2008	31.12.2010
89	fenpropathrın	30.06.2010	30.06.2010	31.08.2011
90	fenpropımorph	30.06.2020	31.07.2020	31.12.2020
91	fenthıon	30.06.2010	30.06.2010	31.08.2011
92	fentın acetate	30.06.2010	30.06.2010	31.08.2011
93	fentın hydroxıde	31.12.2008	31.12.2008	31.12.2010
94	fenvalerate	31.08.2009	31.08.2009	31.08.2011
95	fıpronıl	30.06.2018	30.06.2018	01.01.2019
96	flamprop-m	31.12.2008	31.12.2008	31.12.2010
97	flocoumafen	30.06.2010	30.06.2010	31.08.2011
98	fluazıfop	31.12.2008	31.12.2008	31.12.2010
99	flubenzımıne	31.12.2008	31.12.2008	31.12.2010
100	flucythrınate	31.12.2008	31.12.2008	31.12.2010
101	flufenoxuron	30.06.2011	30.06.2011	31.08.2012
102	flumetsulam	31.12.2009	31.12.2009	31.12.2011

Table 0. 1 (continued). Banned pesticides whose import, manufacture and use have been terminated in Türkiye (T.R. Ministry of Agriculture and Forestry, 2025b)

Nu	Name	Import Termination Date	Production Termination Date	Usage Termination Date
103	fluridone	31.12.2008	31.12.2008	31.12.2010
104	flusilazole	31.12.2020	31.01.2021	30.06.2022
105	fluthiacet methyl	31.08.2009	31.08.2009	31.08.2011
106	folic acid	31.08.2009	31.08.2009	31.08.2011
107	fomesafen	30.06.2010	30.06.2010	31.08.2011
108	formothion	31.12.2008	31.12.2008	31.12.2010
109	furathiocarb	31.12.2008	31.12.2008	31.12.2010
110	halfenprox (aka brofenprox)	31.12.2008	31.12.2008	31.12.2010
111	haloxyfop	31.12.2009	31.12.2009	31.12.2011
112	haloxyfop etoxyethylester	30.06.2010	30.06.2010	31.08.2011
113	hexaconazole	30.06.2010	30.06.2010	31.08.2011
114	hexaflumuron	30.06.2010	30.06.2010	31.08.2011
115	hidrogen peroxide	31.12.2016	31.12.2016	31.12.2017
116	hydrogen cyanamide	31.08.2009	31.08.2009	31.08.2011
117	hydroxy mcpa	31.12.2008	31.12.2008	31.12.2010
118	imazamethabenz methyl	30.06.2010	30.06.2010	31.08.2011
119	imazapic	01.01.2013	01.01.2013	31.12.2014
120	imazapyr	30.06.2010	30.06.2010	31.08.2011
121	imazethapyr	01.01.2013	01.01.2013	31.12.2014
122	imidacloprid	31.08.2023	15.11.2023	31.12.2024 31.12.2025
123	iminoctadine	31.12.2008	31.12.2008	31.12.2010
124	indolylacetic acid (aka auxins)	31.08.2009	31.08.2009	31.08.2011
125	ioxonil	31.12.2020	31.01.2021	30.06.2022
126	iprodione	19.02.2018	19.02.2018	08.06.2018
127	isofenphos	31.12.2008	31.12.2008	31.12.2010
128	kinetin	31.08.2009	31.08.2009	31.08.2011
129	linuron	30.09.2020	31.10.2020	01.08.2023
130	mancozeb	31.12.2021	15.04.2022	31.12.2022
131	maneb	31.08.2020	15.10.2020	30.09.2021
132	mephospholan	31.12.2008	31.12.2008	31.12.2010
133	methabenzthiazuron	31.12.2008	31.12.2008	31.12.2010
134	methidathion	30.06.2010	30.06.2010	31.08.2011
135	methiocarb	31.08.2020	15.10.2020	31.12.2021
136	methomyl	31.08.2020	15.10.2020	30.09.2021
137	methoprene	31.12.2008	31.12.2008	31.12.2010
138	metolachlor	31.08.2009	31.08.2009	31.08.2011
139	metominostrobin	31.08.2009	31.08.2009	31.08.2011
140	metosulam	31.08.2009	31.08.2009	31.08.2011
141	mevinphos	31.12.2008	31.12.2008	31.12.2010
142	molinate	31.08.2020	15.10.2020	30.09.2021
143	monocrotophos	30.06.2010	30.06.2010	31.08.2011
144	monolinuron	31.12.2008	31.12.2008	31.12.2010
145	norflurazon	31.12.2008	31.12.2008	31.12.2010
146	novaluron	31.12.2020	31.01.2021	30.06.2022
147	nuarimol	31.12.2008	31.12.2008	31.12.2010
148	ofurace	31.12.2008	31.12.2008	31.12.2010
149	omethoate	30.06.2011	30.06.2011	31.08.2012
150	orthosulfamuron	30.06.2020	31.07.2020	31.12.2020
151	oxadiazon	30.09.2020	31.10.2020	31.12.2022
152	oxadixyl	30.06.2010	30.06.2010	31.08.2011

Table 0. 1 (continued). Banned pesticides whose import, manufacture and use have been terminated in Türkiye (T.R. Ministry of Agriculture and Forestry, 2025b)

Nu	Name	Import Termination Date	Production Termination Date	Usage Termination Date
153	oxamyl	19.10.2011	19.10.2011	01.06.2012
154	oxine copper	31.12.2008	31.12.2008	31.12.2010
155	oxycarboxin	31.12.2008	31.12.2008	31.12.2010
156	oxydemeton methyl	31.12.2008	31.12.2008	31.12.2010
157	paraquat	01.01.2013	01.01.2013	31.12.2014
158	parathion methyl	31.08.2009	31.08.2009	31.08.2011
159	pcnb (quintozene)	31.08.2009	31.08.2009	31.08.2011
160	permethrin	31.12.2008	31.12.2008	31.12.2010
161	phenthoate	31.12.2008	31.12.2008	31.12.2010
162	phorate	31.08.2009	31.08.2009	31.08.2011
163	phosalone	30.06.2010	30.06.2010	31.08.2011
164	phosphamidon	31.12.2008	31.12.2008	31.12.2010
165	phosphoric acid	01.01.2013	01.01.2013	31.12.2014
166	pinolene	31.08.2009	31.08.2009	31.08.2011
167	plant extracts	31.08.2009	31.08.2009	31.08.2011
168	primisulfuron	31.12.2008	31.12.2008	31.12.2010
169	primisulfuron methyl	30.06.2010	30.06.2010	31.08.2011
170	procymidone	31.08.2009	31.08.2009	31.08.2011
171	profenofos	31.12.2009	31.12.2009	31.12.2011
172	prometryn	01.01.2013	01.01.2013	31.12.2014
173	propanil	30.06.2011	30.06.2011	31.08.2012
174	propargite	31.08.2012	31.08.2012	30.06.2013
175	propiconazole	31.12.2019	31.12.2019	31.12.2020
176	propineb	31.05.2018	31.05.2018	01.01.2019
177	propoxur	31.12.2008	31.12.2008	31.12.2010
178	prothiofos	31.12.2008	31.12.2008	31.12.2010
179	prothoate	31.12.2008	31.12.2008	31.12.2010
180	pymetrozine	31.08.2020	15.10.2020	31.12.2021
181	pyrazophos	31.12.2008	31.12.2008	31.12.2010
182	pyridafenthion	31.12.2008	31.12.2008	31.12.2010
183	pyrimidifen	30.06.2010	30.06.2010	31.08.2011
184	pyrithiobac sodium	04.04.2011	04.04.2011	04.04.2013
185	quinalphos	30.06.2010	30.06.2010	31.08.2011
186	quinoxyfen	31.12.2019	31.12.2019	31.12.2020
187	quizalofop	31.12.2008	31.12.2008	31.12.2010
188	resmethrin	31.12.2008	31.12.2008	31.12.2010
189	sethoxydim	31.12.2008	31.12.2008	31.12.2010
190	simazine	31.12.2008	31.12.2008	31.12.2010
191	sodium derivatives	31.08.2009	31.08.2009	31.08.2011
192	streptomyces lydicus wyel	31.08.2009	31.08.2009	31.08.2011
193	tcmtb	31.12.2008	31.12.2008	31.12.2010
194	tebuthiuron	31.08.2009	31.08.2009	31.08.2011
195	tepraloxydim	31.12.2020	31.01.2021	30.06.2022
196	terbutryne	31.08.2009	31.08.2009	31.08.2011
197	tetradifon	30.06.2010	30.06.2010	31.08.2011
198	thiacloprid	31.12.2020	31.01.2021	30.06.2022 (30.06.2021 Date of Termination of Use in Seed)
99	thiazafluron	31.12.2008	31.12.2008	31.12.2010
200	thiazopyr	31.12.2008	31.12.2008	31.12.2010
201	thiamethoxam	31.08.2023	15.11.2023	31.12.2024 31.12.2025
202	thidiazuron	31.12.2018	31.12.2018	31.12.2019

Table 0. 1 (continued). Banned pesticides whose import, manufacture and use have been terminated in Türkiye (T.R. Ministry of Agriculture and Forestry, 2025b)

Nu	Name	Import Termination Date	Production Termination Date	Usage Termination Date
203	thiobencarb	30.06.2011	30.06.2011	31.08.2012
204	thiocyclam hydrogen oxalate	31.08.2009	31.08.2009	31.08.2011
205	thiodicarb	31.08.2012	31.08.2012	30.06.2013
206	thiometon	31.12.2008	31.12.2008	31.12.2010
207	tolfenpyrad	31.08.2012	31.08.2012	30.06.2013
208	tolylfluanid	30.06.2011	30.06.2011	31.08.2012
209	tralomethrin	31.12.2008	31.12.2008	31.12.2010
210	tralkoxydim	31.12.2020	31.01.2021	31.12.2021
211	triisopropano-lamin	31.08.2009	31.08.2009	31.08.2011
212	triadimefon	30.06.2010	30.06.2010	31.08.2011
213	triadimenol	31.08.2020	15.10.2020	30.09.2021
214	triasulfuron	31.12.2020	31.01.2021	31.12.2021
215	triazamate	31.12.2008	31.12.2008	31.12.2010
216	triazophos	31.12.2008	31.12.2008	31.12.2010
217	trichlorfon	31.12.2008	31.12.2008	31.12.2010
218	tridemorph	31.12.2008	31.12.2008	31.12.2010
219	trifloxysulfu-ron sodium	31.12.2016	31.12.2016	31.12.2017
220	trifluralin	31.08.2012	31.08.2012	30.06.2013
221	triforine	30.06.2010	30.06.2010	31.08.2011
222	trimedlure	31.12.2008	31.12.2008	31.12.2010
223	vinclozin	31.12.2008	31.12.2008	31.12.2010

Table 0.2. Pesticides banned or severely restricted in the European Union (PAN,2006)

Nu	Name	Use limitation
1	1.2-Dibromoethane	banned
2	1.2-Dichloroethane	banned
3	8-Hydroxyquinokine	banned
4	acephate	banned
5	alachlor	banned
6	alanycarb	banned
7	aldicarb	banned
8	aldrin	banned and export banned
9	alkyl mercury compounds	banned
10	alkyloxyl and aryl mercury compounds	banned
11	amitraz	Severe restriction
12	ammonium sulphamate	banned
13	atrazine	banned
14	azafenidin	banned
15	azamethiphos	banned
16	azinphos ethyl	banned
17	binapacryl	banned

Table 0. 2 (continued). Pesticides banned or severely restricted in the European Union (PAN,2006)

Nu	Name	Use limitation
18	camphechlor	banned
19	captafol	banned
20	carbaryl	banned
21	chlordane	banned and export banned
22	chlorfenapyr	Severe restriction
23	chlorfenprop	banned
24	chlozolinate	banned
25	choline. k and na salts of makeic acid	banned
26	cresylic cid	banned
27	cyhalothrin	banned
28	DDT	banned and export banned
29	diazinon	banned
30	dichlorvos	banned
31	dicofol	Severe restriction
32	dieldrin	banned and export banned
33	dimethenamide	banned
34	dinoseb. acetate and salt forms	banned
35	dinoterb	banned
36	endosulfan	banned
37	endrin	banned and export banned
38	ethylene oxide	banned
39	fenitrothion	banned
40	fenthion	Severe restriction
41	fentin acetate	banned
42	fentin hydroxide	banned
43	fenvalerate	banned
44	ferbam	banned
45	flusulfamide	banned
46	HCH	banned
47	heptachlor	banned and export banned
48	hexachlorobenzene	banned and export banned
49	hexaconazole	banned
50	imazamethabenz	banned
51	kasugamycin	banned
52	lindane (gamma-HCH)	banned
53	malathion	banned
54	maleic hydrazide	banned
55	mefluidide	banned
56	mephospholan	banned
57	mercuric oxide	banned
58	mercurous chloride	banned

Table 0. 2 (continued). Pesticides banned or severely restricted in the European Union (PAN,2006)

Nu	Name	Use limitation
59	metalaxyl	banned
60	methabenzthiazuron	banned
61	monolinuron	banned
62	naled	banned
63	nitrofen	banned
64	other inorganic mercury compouds	banned
65	oxydemeton-methyl	banned
66	parathion-ethyl	Severe restriction
67	parathion methyl (methyl parathion)	Severe restriction
68	p-chloronitrobenzene	banned
69	permethrin	banned
70	phosalone	banned
71	polyoxin	banned
72	propham	banned
73	pyrazophos	banned
74	pyradafol	banned
75	quintozene	banned
76	sodium tethrathiocarbonate	banned
77	tecnazene	banned
78	temephos	banned
79	thiodicarb	banned
80	zineb	banned
81	zucchini yellow mosaic virus	banned

Table 0.3. Restricted use pesticides (EPA,2024)

Nu	Name
1	acrolein
2	aldicarb
3	aluminum phosphide
4	azinphos methyl
5	carbofuran
6	chloropicrin
7	clonitralid
8	dicrotophos
9	disulfoton
10	ethoprop
11	ethyl parathion
12	fenamiphos
13	fonofos
14	methamidophos
15	methidathion
16	methomyl
17	methyl bromide
18	methyl parathion
19	nicotine (alkaloid)

Table 0. 3 (continued). Restricted use pesticides (EPA,2024)

Nu	Name
20	paraquat (dichloride) and paraquat bis(methyl sulfate)
21	phorate
22	phosphamidon
23	picloram
24	sodium cyanide
25	sodium fluoroacetate
26	strychnine
27	sulfotepp
28	zinc phosphide

APPENDIX 2 Uncertainty of Individual Solutions in Mix B and Mix C

Table 0.4. Calculation of uncertainty of HCB in individual solution of mix B

1 Hexachlorobenzene (HCB)

For Sample

$\frac{0.036}{\sqrt{3}}=0.021$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	2.94×10^{-2}

weight of HCB (mg) 11.8

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of solvent (mg) 4424.8

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
HCB	11.8	2.94×10^{-2}	6.20×10^{-6}	2.49×10^{-3}
Solvent	4424.8	2.94×10^{-2}	4.43×10^{-11}	
u	2671	6.65		

2671 ppm ± 6.65

Table 0.5. Calculation of uncertainty of Metolachlor in individual solution of mix B

2 metolachlor

For Sample

$\frac{0.036}{\sqrt{3}}=0.021$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

weight of metolachlor (mg) 231.3

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
metolachlor	231.3	$2.94x10^{-2}$	$1.62x10^{-8}$	$1.27x10^{-4}$
Solvent	27205	$2.94x10^{-2}$	$1.17x10^{-12}$	
u	8500	1.08		

weight of solvent (mg) 27205

8500 ppm ± 1.08

Table 0.6. Calculation of uncertainty of 4,4’-DDT in individual solution of mix B

3	4,4’-DDT

For Sample

$\frac{0.036}{\sqrt{3}}=0.021$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

weight of 4,4’-DDT (mg) 41.18

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036
weight of solvent (mg)	2328.96

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
4,4’-DDT	41.18	$2.94x10^{-2}$	$5.11x10^{-7}$	$7.15x10^{-4}$
Solvent	2328.96	$2.94x10^{-2}$	$1.60x10^{-10}$	
u	17681.73	12.64		

17681.73 ppm ± 12.64

Table 0.7. Calculation of uncertainty of 2,4'-DDT in individual solution of mix B

4 2,4'-DDT

For Sample

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of 4,4'-DDT (mg) 16.65

$\frac{0.036}{\sqrt{3}}=0.021$

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of solvent (mg) 1297.42

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
2,4'-DDT	16.65	$2.94x10^{-2}$	$3.13x10^{-6}$	$1.77x10^{-3}$
Solvent	1297.42	$2.94x10^{-2}$	$5.15x10^{-10}$	
u	12833.17	22.69		

12833 ppm ± 22.69

Table 0.8. Calculation of uncertainty of 4,4’-DDD in individual solution of mix B

5 4,4’-DDD

For Sample

$\frac{0.036}{\sqrt{3}}=0.021$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of 4,4’-DDD (mg) 11.18

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of solvent (mg) 1188.02

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
4,4’-DDD	11.18	$2.94x10^{-2}$	$6.93x10^{-6}$	$2.63x10^{-3}$
Solvent	1188.02	$2.94x10^{-2}$	$6.14x10^{-10}$	
u	9410.60	24.78		

9410.60 ppm ± 24.78

Table 0.9. Calculation of uncertainty of Aldrin in individual solution of mix B

6 aldrin (HHDN)

For Sample

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of aldrin (mg) 20.71

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of solvent (mg) 1746.54

$\frac{0.036}{\sqrt{3}}=0.021$

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
aldrin	20.71	$2.94x10^{-2}$	$2.02x10^{-6}$	$1.42x10^{-3}$
Solvent	1746.54	$2.94x10^{-2}$	$2.84x10^{-10}$	
u	11857.71	16.86		

11857.71 ppm ± 16.86

Table 0.10. Calculation of uncertainty of Dieldrin in individual solution of mix B

7	dieldrin

For Sample

$$\frac{0.036}{\sqrt{3}} = 0.021$$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	2.94×10^{-2}

weight of dieldrin (mg) 35.15

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of solvent (mg) 1987.93

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
dieldrin	35.15	2.94×10^{-2}	7.01×10^{-7}	8.38×10^{-4}
Solvent	1987.93	2.94×10^{-2}	2.19×10^{-10}	
u	17681.73	14.81		

17681.73 ppm ± 14.81

Table 0.11. Calculation of uncertainty of alpha-Endosulfan in individual solution of mix B

8	alpha-endosulfan

For Sample

$$\frac{0.036}{\sqrt{3}} = 0.021$$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability) ^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	2.94×10^{-2}

weight of alpha-endosulfan (mg) 31.02

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of solvent (mg) 1582.02

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
alpha-endosulfan	31.02	2.94×10^{-2}	9.01×10^{-7}	9.49×10^{-4}
Solvent	1582.02	2.94×10^{-2}	3.46×10^{-10}	
u	19607.84	18.61		

19607.84
ppm ± 18.61

Table 0.12. Calculation of uncertainty of *beta*-Endosulfan in individual solution of mix B

9	beta-endosulfan

For Sample

$$\frac{0.036}{\sqrt{3}} = 0.021$$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	2.94×10^{-2}

weight of beta-endosulfan (mg) 26.29

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
beta-endosulfan	26.29	2.94×10^{-2}	1.25×10^{-6}	1.12×10^{-3}
Solvent	1572.76	2.94×10^{-2}	3.50×10^{-10}	
u	16715.83	18.72		

weight of solvent (mg) 1572.76

16715.83 ppm
± 18.72

Table 0.13. Calculation of uncertainty of Endrin in individual solution of mix B

10 endrin

For Sample

$\frac{0.036}{\sqrt{3}}=0.021$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

weight of endrin (mg) 31.03

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of solvent (mg) 2099.70

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
endrin	31.03	$2.94x10^{-2}$	$9.00x10^{-7}$	$9.49x10^{-4}$
Solvent	2099.70	$2.94x10^{-2}$	$1.97x10^{-10}$	
u	14778.33	14.02		

14778.33 ppm ± 14.02

Table 0.14. Calculation of uncertainty of *alpha*-HCH in individual solution of mix B

11 *alpha*-HCH

For Sample

$\frac{0.036}{\sqrt{3}}=0.021$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	2.94×10^{-2}

weight of alpha-HCH (mg) 39.25

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
HCH-alpha (Alpha BHC)	39.25	2.94×10^{-2}	5.63×10^{-7}	7.50×10^{-4}
Solvent	2219.81	2.94×10^{-2}	1.76×10^{-10}	
u	17681.73	13.26		

weight of solvent (mg) 2180.56

17681.73 ppm ± 13.50

Table 0.15. Calculation of uncertainty of *gamma*-HCH in individual solution of mix B

12	*gamma*-HCH

For Sample

$\frac{0.036}{\sqrt{3}}=0.021$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

weight of gamma-HCH (mg) 14.20

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of solvent (mg) 1307.87

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
HCH-gamma (Lindane. Gamma BHC)	14.20	$2.94x10^{-2}$	$4.28x10^{-6}$	$2.07x10^{-3}$
Solvent	1307.87	$2.94x10^{-2}$	$5.07x10^{-10}$	
u	10880.32	22.51		

10880.32 ppm ± 22.51

Table 0.16. Calculation of uncertainty of Heptachlor in individual solution of mix B

13 heptachlor

For Sample

$\frac{0.036}{\sqrt{3}}=0.021$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

weight of heptachlor (mg) 27.70

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of solvent (mg) 1566.02

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
heptachlor	27.70	$2.94x10^{-2}$	$1.13x10^{-6}$	$1.06x10^{-3}$
Solvent	1566.02	$2.94x10^{-2}$	$3.53x10^{-10}$	
u	17681.73	18.80		

17681.73ppm ± 18.80

Table 0.17. Calculation of uncertainty of Heptachlor-*endo*-epoxide in individual solution of mix B

14	heptachlor-*endo*-epoxide

For Sample

$\frac{0.036}{\sqrt{3}}=0.021$

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

weight of heptachlor endoepoxide (mg) 15.11

For Solvent

Balance:

Linearity	0.03
Repeatability	0.02
u=√((linearity)^2+(repeatability)^2)	
u	0.036

weight of solvent (mg) 1903.86

	Value(X)	*u(X)*	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
heptachlor-endo-epoxide (Isomer A) (Trans-heptachloroepoxide)	15.11	$2.94x10^{-2}$	$3.80x10^{-6}$	$1.95x10^{-3}$
Solvent	1903.86	$2.94x10^{-2}$	$2.39x10^{-10}$	
u	7936.51	15.46		

8000 ppm ± 15.59

Table 0.18. Calculation of uncertainty of 4,4’-DDT in individual solution of mix C

1	4,4’-DDT									
	For Sample			$\frac{0.036}{\sqrt{3}}=0.021$						
	Balance:			Uncertainty of Balance						
	Linearity	0.03		Uncertainty component	*u(X)*					
	Repeatability	0.02		Calibration (tare)	0.021					
	u=√((linearity)^2+(repeatability)^2)			Calibration (sample)	0.021					
	u	0.036		Combined Uncertainty	$2.94x10^{-2}$					
	weight of 4,4’-DDT (mg)	41.20							Standard Uncertainty	Standard Uncertainty u(V) of Volume V
	For Solvent			Temperature change in the lab. °C	3					
	Pipet:		Volume of the pipette	The coefficient of volume expansion for acetonitrile °C-1	$1.40x10^{-3}$	Triangular distribution			0.005	0.006
	Accuracy	0.60%	$\frac{0.006}{\sqrt{6}}=0.002$	Volume of the pipette (0.5-5 mL), ml	2.91					
	=√(accuracy)^2	0.006		Cal uncertainty of the pipette, ml std	0.002					
	volume of solvent (mL)	2.91								
			Value(X)	u(X)	[X/u(x)]2	√[X/u(x)]i2+…[X/u(x)]n2				
		4,4'-DDT	41.18	$2.94x10^{-2}$	$5.11x10^{-7}$	$2.04x10^{-3}$		14148 ppm ± 28.8		
		Solvent	2.91	$5.55x10^{-3}$	$3.64x10^{-6}$					
		u	14148.00	28.81						

Table 0.19. Calculation of uncertainty of 2,4'-DDT in individual solution of mix C

2	2,4'-DDT									
	For Sample			$\frac{0.036}{\sqrt{3}}=0.021$						
	Balance:			Uncertainty of Balance						
	Linearity	0.03		Uncertainty component	*u(X)*					
	Repeatability	0.02		Calibration (tare)	0.021					
	u=√((linearity)^2+(repeatability)^2)			Calibration (sample)	0.021					
	u	0.036		Combined Uncertainty	$2.94x10^{-2}$					
	weight of 2,4'-DDT (mg)	16.65							Standard Uncertainty	Standard Uncertainty u(V) of Volume V
	For Solvent			Temperature change in the lab. °C	3					
	Pipet:		Volume of the pipette	The coefficient of volume expansion for acetonitrile °C-1	$1.40x10^{-3}$	Triangular distribution			0.003	0.004
	Accuracy	0.60%	$\frac{0.006}{\sqrt{6}}=0.002$	Volume of the pipette (0.5-5 mL), ml	1.63					
	=√(accuracy)^2	0.006		Cal uncertainty of the pipette, ml std	0.002					
	volume of solvent (mL)	1.63								
			Value(X)	u(X)	[X/u(x)]2	√[X/u(x)]i2+…[X/u(x)]n2				
		2,4'-DDT	16.65	$2.94x10^{-2}$	$3.13x10^{-6}$	$2.88x10^{-3}$			10218 ppm ± 29.5	
		Solvent	1.63	$3.71x10^{-3}$	$5.19x10^{-6}$					
		u	10218.00	29.46						

Table 0.20. Calculation of uncertainty of 4,4’-DDD in individual solution of mix C

3	4,4’-DDD									
	For Sample			$\frac{0.036}{\sqrt{3}}=0.021$						
	Balance:			Uncertainty of Balance						
	Linearity	0.03		Uncertainty component	*u(X)*					
	Repeatability	0.02		Calibration (tare)	0.021					
	u=√((linearity)^2+(repeatability)^2)			Calibration (sample)	0.021					
	u	0.036		Combined Uncertainty	2.94×10^{-2}					
	weight of 4,4’-DDD (mg)	11.18							Standard Uncertainty	Standard Uncertainty u(V) of Volume V
	For Solvent			Temperature change in the lab. °C	3					
	Pipet:		Volume of the pipette	The coefficient of volume expansion for acetonitrile °C-1	1.40×10^{-3}	Triangular distribution			0.003	0.004
	Accuracy	0.60%	$\frac{0.006}{\sqrt{6}}=0.002$	Volume of the pipette (0.5-5 mL), ml	1.50					
	=√(accuracy)^2	0.006		Cal uncertainty of the pipette, ml std	0.002					
	volume of solvent (mL)	1.50								
			Value(X)	u(X)	[X/u(x)]2	√[X/u(x)]i2+…[X/u(x)]n2				
		4,4'-DDD	11.18	2.94×10^{-2}	6.93×10^{-6}	3.54×10^{-3}			7467 ppm ± 26.4	
		Solvent	1.50	3.54×10^{-3}	5.60×10^{-6}					
		u	7467.00	26.44						

Table 0.21. Calculation of uncertainty of Aldrin in individual solution of mix C

4	aldrin									
	For Sample				$\frac{0.036}{\sqrt{3}}=0.021$					
	Balance:				Uncertainty of Balance					
	Linearity	0.03			Uncertainty component	*u(X)*				
	Repeatability	0.02			Calibration (tare)	0.021				
	u=√((linearity)^2+(repeatability)^2)				Calibration (sample)	0.021				
	u	0.036			Combined Uncertainty	$2.94x10^{-2}$				
	weight of aldrin (mg)	20.71							Standard Uncertainty	Standard Uncertainty u(V) of Volume V
	For Solvent				Temperature change in the lab. °C	3				
	Pipet:			Volume of the pipette	The coefficient of volume expansion for acetonitrile °C-1	$1.40x10^{-3}$	Triangular distribution		0.004	0.005
	Accuracy	0.60%		$\frac{0.006}{\sqrt{6}}=0.002$	Volume of the pipette (0.5-5 mL), ml	2.22				
	=√(accuracy)^2	0.006			Cal uncertainty of the pipette, ml std	0.002				
	volume of solvent (mL)	2.22								
			Value(X)	u(X)	[X/u(x)]2	√[X/u(x)]i2+…[X/u(x)]n2				
		aldrin	20.71	$2.94x10^{-2}$	$2.02x10^{-6}$	$2.48x10^{-3}$		9320.16 ppm ± 23.1		
		Solvent	2.22	0.005	$4.14x10^{-6}$					
		u	9320.16	23.14						

Table 0.22. Calculation of uncertainty of Dieldrin in individual solution of mix C

5	dieldrin									
	For Sample				$\frac{0.036}{\sqrt{3}}=0.021$					
	Balance:				Uncertainty of Balance					
	Linearity	0.03			Uncertainty component	*u(X)*				
	Repeatability	0.02			Calibration (tare)	0.021				
	u=√((linearity)^2+(repeatability)^2)				Calibration (sample)	0.021				
	u	0.036			Combined Uncertainty	$2.94x10^{-2}$				
	weight of dieldrin (mg)	35.15							Standard Uncertainty	Standard Uncertainty u(V) of Volume V
	For Solvent				Temperature change in the lab. °C	3				
	Pipet:			Volume of the pipette	The coefficient of volume expansion for acetonitrile °C-1	$1.40x10^{-3}$		Triangular distribution	0.004	0.005
	Accuracy	0.60%		$\frac{0.006}{\sqrt{6}}=0.002$	Volume of the pipette (0.5-5 mL), ml	2.48				
	=√(accuracy)^2	0.006			Cal uncertainty of the pipette, ml std	0.002				
	volume of solvent (mL)	2.48								
			Value(X)	u(X)	[X/u(x)]2	√[X/u(x)]i2+…[X/u(x)]n2				
		dieldrin	35.15	$2.94x10^{-2}$	$7.01x10^{-7}$	$2.14x10^{-3}$		14148 ppm ± 30.4		
		Solvent	2.48	0.005	$3.90x10^{-6}$					
		u	14148.00	30.35						

Table 0.23. Calculation of uncertainty of *alpha*-Endosulfan in individual solution of mix C

6	*alpha*-endosulfan									
For Sample			$\frac{0.036}{\sqrt{3}}=0.021$							
Balance:			Uncertainty of Balance							
Linearity	0.03		Uncertainty component	*u(X)*						
Repeatability	0.02		Calibration (tare)	0.021						
u=√((linearity)^2+(repeatability)^2)			Calibration (sample)	0.021						
u	0.036		Combined Uncertainty	$2.94x10^{-2}$						
weight of *alpha*-endosulfan (mg)	31.02								Standard Uncertainty	Standard Uncertainty u(V) of Volume V
For Solvent			Temperature change in the lab. °C	3						
Pipet:		Volume of the pipette	The coefficient of volume expansion for acetonitrile °C-1	$1.40x10^{-3}$	Triangular distribution				0.003	0.004
Accuracy	0.60%	$\frac{0.006}{\sqrt{6}}=0.002$	Volume of the pipette (0.5-5 mL), ml	1.97						
=√(accuracy)^2	0.006		Cal uncertainty of the pipette, ml std	0.002						
volume of solvent (mL)	1.97									
		Value(X)	u(X)	[X/u(x)]2	√[X/u(x)]i2+…[X/u(x)]n2					
	alpha-endosulfan	31.02	$2.94x10^{-2}$	$9.01x10^{-7}$	$2.32x10^{-3}$				15720 ppm ± 36.4	
	Solvent	1.97	0.004	$4.47x10^{-6}$						
	u	15720.00	36.42							

Table 0.24. Calculation of uncertainty of *beta*-Endosulfan in individual solution of mix C

7	*beta*-endosulfan									
	For Sample			$\frac{0.036}{\sqrt{3}}=0.021$						
	Balance:			Uncertainty of Balance						
	Linearity	0.03		Uncertainty component	*u(X)*					
	Repeatability	0.02		Calibration (tare)	0.021					
	u=√((linearity)^2+(repeatability)^2)			Calibration (sample)	0.021					
	u	0.036		Combined Uncertainty	$2.94x10^{-2}$					
	weight of *beta*-endosulfan (mg)	26.29							Standard Uncertainty	Standard Uncertainty u(V) of Volume V
	For Solvent			Temperature change in the lab. °C	3					
	Pipet:		Volume of the pipette	The coefficient of volume expansion for acetonitrile °C-1	$1.40x10^{-3}$	Triangular distribution			0.003	0.004
	Accuracy	0.60%	$\frac{0.006}{\sqrt{6}}=0.002$	Volume of the pipette (0.5-5 mL), ml	1.97					
	=√(accuracy)^2	0.006		Cal uncertainty of the pipette, ml std	0.002					
	volume of solvent (mL)	1.97								
			Value(X)	u(X)	[X/u(x)]2	√[X/u(x)]i2+…[X/u(x)]n2				
		beta-endosulfan	26.29	$2.94x10^{-2}$	$1.25x10^{-6}$	$2.40x10^{-3}$	13362 ppm ± 32.0			
		Solvent	1.97	0.004	$4.49x10^{-6}$					
		u	13362.00	32.04						

Table 0.25. Calculation of uncertainty of Endrin in individual solution of mix C

8	endrin									
	For Sample			$\frac{0.036}{\sqrt{3}}=0.021$						
	Balance:			Uncertainty of Balance						
	Linearity	0.03		Uncertainty component	*u(X)*					
	Repeatability	0.02		Calibration (tare)	0.021					
	u=√((linearity)^2+(repeatability)^2)			Calibration (sample)	0.021					
	u	0.036		Combined Uncertainty	$2.94x10^{-2}$					
	weight of endrin (mg)	31.03							Standard Uncertainty	Standard Uncertainty u(V) of Volume V
	For Solvent			Temperature change in the lab. °C	3					
	Pipet:		Volume of the pipette	The coefficient of volume expansion for acetonitrile °C-1	$1.40x10^{-3}$	Triangular distribution			0.005	0.005
	Accuracy	0.60%	$\frac{0.006}{\sqrt{6}}=0.002$	Volume of the pipette (0.5-5 mL), ml	2.63					
	=√(accuracy)^2	0.006		Cal uncertainty of the pipette, ml std	0.002					
	volume of solvent (mL)	2.63								
			Value(X)	u(X)	[X/u(x)]2	√[X/u(x)]i2+…[X/u(x)]n2				
		endrin	31.03	$2.94x10^{-2}$	$9.00x10^{-7}$	$2.17x10^{-3}$		11790 ppm ± 25.5		
		Solvent	2.63	0.005	$3.79x10^{-6}$					
		u	11790.00	25.54						

Table 0.26. Calculation of uncertainty of *alpha*-HCH in individual solution of mix C

9	*alpha*-HCH									
	For Sample			$\frac{0.036}{\sqrt{3}}=0.021$						
	Balance:			Uncertainty of Balance						
	Linearity	0.03		Uncertainty component	*u(X)*					
	Repeatability	0.02		Calibration (tare)	0.021					
	u=√((linearity)^2+(repeatability)^2)			Calibration (sample)	0.021					
	u	0.036		Combined Uncertainty	$2.94x10^{-2}$					
	weight of *alpha*-HCH (mg)	41.20							Standard Uncertainty	Standard Uncertainty u(V) of Volume V
	For Solvent			Temperature change in the lab. °C	3					
	Pipet:		Volume of the pipette	The coefficient of volume expansion for acetonitrile °C-1	1.40x10-3	Triangular distribution			0.005	0.006
	Accuracy	0.03	$\frac{0.006}{\sqrt{6}}=0.002$	Volume of the pipette (0.5-5 mL), ml	2.91					
	=√(accuracy)^2	0.02		Cal uncertainty of the pipette, ml std	0.002					
	volume of solvent (mL)	2.91								
			Value(X)	u(X)	[X/u(x)]2	√[X/u(x)]i2+…[X/u(x)]n2				
		alpha-HCH	41.18	$2.94x10^{-2}$	$5.11x10^{-7}$	$2.04x10^{-3}$			14148 ppm ± 28.8	
		Solvent	2.91	$5.55x10^{-3}$	$3.64x10^{-6}$					
		u	14148.00	28.81						

Table 0.27. Calculation of uncertainty of *gamma*-HCH in individual solution of mix C

10	*gamma*-HCH									
	For Sample			$\frac{0.036}{\sqrt{3}}=0.021$						
	Balance:			Uncertainty of Balance						
	Linearity	0.03		Uncertainty component	*u(X)*					
	Repeatability	0.02		Calibration (tare)	0.021					
	u=√((linearity)^2+(repeatability)^2)			Calibration (sample)	0.021					
	u	0.036		Combined Uncertainty	$2.94x10^{-2}$					
	weight of *gamma*-HCH (mg)	41.20							Standard Uncertainty	Standard Uncertainty u(V) of Volume V
	For Solvent			Temperature change in the lab. °C	3					
	Pipet:		Volume of the pipette	The coefficient of volume expansion for acetonitrile °C-1	$1.40x10^{-3}$	Triangular distribution			0.005	0.006
	Accuracy	0.03	$\frac{0.006}{\sqrt{6}}=0.002$	Volume of the pipette (0.5-5 mL), ml	2.91					
	=√(accuracy)^2	0.02		Cal uncertainty of the pipette, ml std	0.002					
	volume of solvent (mL)	2.91								
			Value(X)	u(X)	[X/u(x)]2	√[X/u(x)]i2+…[X/u(x)]n2				
		gamma-HCH	41.18	$2.94x10^{-2}$	$5.11x10^{-7}$	$2.04x10^{-3}$			14148 ppm ± 28.8	
		Solvent	2.91	$5.55x10^{-3}$	$3.64x10^{-6}$					
		u	14148.00	28.81						

Table 0.28. Calculation of uncertainty of Heptachlor in individual solution of mix C

11	heptachlor									
For Sample				$\frac{0.036}{\sqrt{3}}=0.021$						
Balance:				Uncertainty of Balance						
Linearity	0.03			Uncertainty component	*u(X)*					
Repeatability	0.02			Calibration (tare)	0.021					
u=√((linearity)^2+(repeata-bility)^2)				Calibration (sample)	0.021					
u	0.036			Combined Uncertainty	$2.94x10^{-2}$					
weight of hepta-chlor (mg)	41.20								Standard Uncertainty	Standard Uncertainty u(V) of Volume V
For Solvent				Temperature change in the lab. °C	3					
Pipet:			Volume of the pipette	The coefficient of volume expansion for acetonitrile °C-1	1.40x10-3	Triangular distribution			0.005	0.006
Accuracy	0.03		$\frac{0.006}{\sqrt{6}}=0.002$	Volume of the pipette (0.5-5 mL), ml	2.91					
=√(accuracy)^2	0.02			Cal uncertainty of the pipette, ml std	0.002					
volume of solvent (mL)	2.91									
		Value(X)	u(X)	[X/u(x)]2	√[X/u(x)]i2+…[X/u(x)]n2					
	hepta-chlor	41.18	$2.94x10^{-2}$	$5.11x10^{-7}$	$2.04x10^{-3}$					
	Solvent	2.91	$5.55x10^{-3}$	$3.64x10^{-6}$						
	u	14148.00	28.81							
									14148 ppm ± 28.8	

APPENDIX 3 Uncertainty of Subgroups in Mix B and Mix C

Table 0.29. The uncertainty of Metolachlor in subgroup 2 for mixture I of mix B

group2 (1000 ppm 2000 mg)

Uncertainty for solvent:

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of materials	1397.1
Weight of solvent	603.9

	Value(X)	*u(X)*	
metolachlor	236.3	$2.94x10^{-2}$	$8.67x10^{-4}$
ethoprophos (prophos)	200	$2.94x10^{-2}$	$8.67x10^{-4}$
mevinphos	250	$2.94x10^{-2}$	$8.67x10^{-4}$
ısofenphos	266.7	$2.94x10^{-2}$	$8.67x10^{-4}$
diazinon	217.4	$2.94x10^{-2}$	$8.67x10^{-4}$
cyfluthrin (mixture of isomers)	226.7	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	603.9	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0779		

5000 mg ± 0.0779

For uncertainty of metalochlor in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$$1004\ ppm\ \pm\ ? = \frac{(8500\ ppm \pm 1.08) * (236.3\ mg \pm 0.0294)}{2000\ mg \pm 0.0779}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of metolachlor (ind. soln)	8500	1.08	$1.62x10^{-8}$	$1.82x10^{-4}$
Amount of metalachlor	236.3	$2.94x10^{-2}$	$1.55x10^{-8}$	
Solvent	2000	0.0779	$1.52x10^{-9}$	
u	1004	0.18		
1004 ppm ± 0.18				

Table 0.30. The uncertainty of HCB in subgroup 16 for mixture I of mix B

group16 (400 ppm 2000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$
Total weight of pesticides	1769.3
Weight of solvent	230.7

Uncertainty for solvent:

	Value(X)	*u(X)*	
HCB	299.5	$2.94x10^{-2}$	$8.67x10^{-4}$
diphenamid	400.8	$2.94x10^{-2}$	$8.67x10^{-4}$
mirex	400.8	$2.94x10^{-2}$	$8.67x10^{-4}$
tetrasul	267.5	$2.94x10^{-2}$	$8.67x10^{-4}$
iprodione	400.8	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	230.7	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0721		

2000 mg ± 0.0721

For uncertainty of HCB in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$$400\ ppm\ \pm ? = \frac{(2671.3\ ppm\ \pm 6.67) * (299.5\ mg\ \pm 0.0294)}{2000\ mg\ \pm 0.0721}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of HCB (ind. soln)	2671.3	6.65	$6.20x10^{-6}$	$2.49x10^{-3}$
Amount of HCB	299.5	$2.94x10^{-2}$	$9.66x10^{-9}$	
Solvent	2000	0.0721	$1.30x10^{-9}$	
u	400	1.00		

400 ppm ± 1.00

Table 0.31. The uncertainty of Heptachlor-*endo*-epoxide in subgroup 5 for mixture II of mix B

group5 (1400 ppm 1200 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	979.4
Weight of solvent	220.6

	Value(X)	*u(X)*	
heptachlor- *endo*-epoxide	211.7	$2.94x10^{-2}$	$8.67x10^{-4}$
fenvalerate	241.7	$2.94x10^{-2}$	$8.67x10^{-4}$
pyrazophos	141.7	$2.94x10^{-2}$	$8.67x10^{-4}$
chlorothalonil	213.7	$2.94x10^{-2}$	$8.67x10^{-4}$
oxyfluorfen	170.7	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	220.6	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0721		

1200 mg ± 0.0721

For uncertainty of heptachlor-*endo*-epoxide in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$$1400\ ppm\ \pm ? = \frac{(7936.51\ \text{ppm} \pm 15.49\ ) * (211.68\ mg \pm 0{,}0294)}{1200\ mg \pm 0{,}0721}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of heptachlor-*endo*-epoxide (ind. soln)	7936.5	15.49	$3.81x10^{-6}$	$1.96x10^{-3}$
Amount of heptachlor-*endo*-epoxide	211.7	$2.94x10^{-2}$	$1.93x10^{-8}$	
Solvent	1200	0.0721	$3.61x10^{-9}$	
u	1400	2.74		

1400 ppm ± 2.74

Table 0.32. The uncertainty of Endrin in subgroup 7 for mixture II of mix B

group7 (900 ppm 1000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$
Total weight of pesticides	318.6
Weight of solvent	681.4

Uncertainty for solvent:

	Value(X)	*u(X)*	
endrin	60.9	$2.94x10^{-2}$	$8.67x10^{-4}$
aldrin	75.9	$2.94x10^{-2}$	$8.67x10^{-4}$
chlorthal-dimethyl (DCPA, TCTP, Dacthal)	150.9	$2.94x10^{-2}$	$8.67x10^{-4}$
nitrofen	30.9	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	681.4	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0658		

1000 mg ± 0.0658

For uncertainty of endrin in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$$900\ ppm\ \pm ? = \frac{(14778.3\ \text{ppm} \pm 14.02)*(60.9\ mg \pm 0.0294)}{1000\ mg \pm 0.0658}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of endrin (ind. soln)	14778.3	14.02	$9.00x10^{-7}$	$1.07x10^{-3}$
Amount of endrin	60.9	$2.94x10^{-2}$	$2.34x10^{-7}$	
Solvent	1000	0.0658	$4.33x10^{-9}$	
u	900	0.96		

900 ppm ± 0.96

Table 0.33. The uncertainty of Aldrin in subgroup 7 for mixture II of mix B

grup7 (900 ppm 1000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$
Total weight of pesticides	318.6
Weight of solvent	681.4

	Value(X)	*u(X)*	
endrin	60.9	$2.94x10^{-2}$	$8.67x10^{-4}$
aldrin	75.9	$2.94x10^{-2}$	$8.67x10^{-4}$
chlorthal-dimethyl (DCPA, TCTP, Dacthal)	150.9	$2.94x10^{-2}$	$8.67x10^{-4}$
nitrofen	30.9	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	681.4	$2.94x10^{-2}$	$8.67x10^{-4}$
u		0.0658	

1000 mg ± 0.0658

For uncertainty of aldrin in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$900\ ppm\ \pm ? = \frac{(11857.7\ ppm \pm 16.86) * (75.9\ mg \pm 0.0294)}{1000\ mg \pm 0.0658}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of aldrin (ind. soln)	11857.7	16.86	$2.02x10^{-6}$	
Amount of aldrin	75.9	$2.94x10^{-2}$	$1.50x10^{-7}$	$1.48x10^{-3}$
Solvent	1000	0.0658	$4.33x10^{-9}$	
u	900	1.33		

900 ppm ± 1.33

Table 0.34. The uncertainty of 4,4'-DDD in subgroup 10 for mixture II of mix B

group10 (1100 ppm 2000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1619.4
Weight of solvent	380.6

	Value(X)	*u(X)*	
4,4'-DDD	233.8	$2.94x10^{-2}$	$8.67x10^{-4}$
4,4'-DDE	222.2	$2.94x10^{-2}$	$8.67x10^{-4}$
diflufenican	222.2	$2.94x10^{-2}$	$8.67x10^{-4}$
HCH-beta (Beta BHC)	222.2	$2.94x10^{-2}$	$8.67x10^{-4}$
2,4'-DDD	112.2	$2.94x10^{-2}$	$8.67x10^{-4}$
cyhalothrin-lambda	90.2	$2.94x10^{-2}$	$8.67x10^{-4}$
methoxychlor	202.2	$2.94x10^{-2}$	$8.67x10^{-4}$
2,4'-DDE	202.2	$2.94x10^{-2}$	$8.67x10^{-4}$
flurochloridone	112.2	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	380.6	$2.94x10^{-2}$	$8.67x10^{-4}$
u		0.0931	

2000 mg ± 0.0931

For uncertainty of 4,4'-DDD in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$1100\ ppm\ \pm\ ? = \frac{(9410.6\ \text{ppm} \pm 24.78) * (233.8\ mg \pm 0.0294)}{2000\ mg \pm 0.0931}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of 4,4'-DDD (ind. soln)	9410.6	24.78	$6.93x10^{-6}$	$2.64x10^{-3}$
Amount of 4,4'-DDD	233.8	$2.94x10^{-2}$	$1.59x10^{-8}$	
Solvent	2000	0.0931	$2.17x10^{-9}$	
u	1100	2.90		

1100 ppm ± 2.90

Table 0.35. The uncertainty of *gamma*-HCH in subgroup 11 for mixture II of mix B

group11 (1100 ppm 2000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1724.3
Weight of solvent	275.7

	Value(X)	*u(X)*	
gamma-HCH	202.2	$2.94x10^{-2}$	$8.67x10^{-4}$
alpha-endosulfan	112.2	$2.94x10^{-2}$	$8.67x10^{-4}$
dicofol (kelthane)	202.2	$2.94x10^{-2}$	$8.67x10^{-4}$
cypermethrin-alpha (alphamethrin)	112.2	$2.94x10^{-2}$	$8.67x10^{-4}$
cyhalofop-butyl	119.0	$2.94x10^{-2}$	$8.67x10^{-4}$
trifluralin	112.2	$2.94x10^{-2}$	$8.67x10^{-4}$
vinclozolin	277.2	$2.94x10^{-2}$	$8.67x10^{-4}$
2-Phenylphenol (Ortho phenylphenol)	185.5	$2.94x10^{-2}$	$8.67x10^{-4}$
oxadiazon	124.4	$2.94x10^{-2}$	$8.67x10^{-4}$
bitertanol (biloxazol) (mixture of izomers and diastomers)	277.2	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	275.7	$2.94x10^{-2}$	$8.67x10^{-4}$
u		0.0976	
2000 mg ± 0.0976			

For uncertainty of *gamma*-HCH in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$1100\ ppm\ \pm ? = \frac{(10880.32\ ppm \pm 22.51) * (202.2\ mg \pm 0.0294)}{2000\ mg \pm 0.0976}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentaion of *gamma*-HCH (ind. soln)	10880.3	22.51	$4.28x10^{-6}$	$2.07x10^{-3}$
Amount of *gamma*-HCH	202.2	$2.94x10^{-2}$	$2.12x10^{-8}$	
Solvent	2000	0.0976	$2.38x10^{-9}$	
u	1100	2.28		
1100 ppm ± 2.28				

Table 0.36. The uncertainty of *alpha*-Endosulfan in subgroup 11 for mixture II of mix B

group11 (1100 ppm 2000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1724.3
Weight of solvent	275.7

	Value(X)	*u(X)*	
gamma-HCH	202.2	$2.94x10^{-2}$	$8.67x10^{-4}$
alpha-endosulfan	112.2	$2.94x10^{-2}$	$8.67x10^{-4}$
dicofol (kelthane)	202.2	$2.94x10^{-2}$	$8.67x10^{-4}$
cypermethrin-alpha (alphamethrin)	112.2	$2.94x10^{-2}$	$8.67x10^{-4}$
cyhalofop-butyl	119.0	$2.94x10^{-2}$	$8.67x10^{-4}$
trifluralin	112.2	$2.94x10^{-2}$	$8.67x10^{-4}$
vinclozolin	277.2	$2.94x10^{-2}$	$8.67x10^{-4}$
2-Phenylphenol (Ortho phenylphenol)	185.5	$2.94x10^{-2}$	$8.67x10^{-4}$
oxadiazon	124.4	$2.94x10^{-2}$	$8.67x10^{-4}$
bitertanol (biloxazol) (mixture of izomers and diastomers)	277.2	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	275.7	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0976		
2000 mg ± 0.0976			

For uncertainty of alpha-endosulfan in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1} \quad 1100\ ppm\ \pm ? = \frac{(19607.84\ ppm \pm 18,.61) * (112.2\ mg \pm 0.0294)}{2000\ mg \pm 0.0976}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of *alpha*-endosulfan (ind. soln)	19607.8	18.61	$9.01x10^{-7}$	$9.86x10^{-4}$
Amount of *alpha*-endosulfan	112.2	$2.94x10^{-2}$	$6.88x10^{-8}$	
Solvent	2000	0.0976	$2.38x10^{-9}$	
u	1110	1.08		
1110 ppm ± 1.08				

Table 0.37. The uncertainty of Heptachlor in subgroup 12 for mixture II of mix B

group12 (1100 ppm 2000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1642.4
Weight of solvent	357.6

Uncertainty for solvent:

	Value(X)	*u(X)*	
heptachlor	124.4	$2.94x10^{-2}$	$8.67x10^{-4}$
4,4'-DDT	125.4	$2.94x10^{-2}$	$8.67x10^{-4}$
metazachlor	185.5	$2.94x10^{-2}$	$8.67x10^{-4}$
benalaxyl	185.5	$2.94x10^{-2}$	$8.67x10^{-4}$
benfluralin	124.4	$2.94x10^{-2}$	$8.67x10^{-4}$
tetradifon	277.2	$2.94x10^{-2}$	$8.67x10^{-4}$
spiromesifen	124.4	$2.94x10^{-2}$	$8.67x10^{-4}$
quinoxyfen	185.5	$2.94x10^{-2}$	$8.67x10^{-4}$
azinphos-ethyl	185.5	$2.94x10^{-2}$	$8.67x10^{-4}$
esfenveralate	124.4	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	357.6	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0976		
2000 mg ± 0.0976			

For uncertainty of heptachlor in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$1100\ ppm\ \pm\ ? = \frac{(17681.73ppm\ \pm\ 18.80) * (124.42\ mg\ \pm 0.0294)}{2000\ mg\ \pm 0.0976}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of heptachlor (ind. soln)	17681.7	18.80	$1.13x10^{-6}$	$1.09x10^{-3}$
Amount of heptachlor	124.4	$2.94x10^{-2}$	$5.60x10^{-8}$	
Solvent	2000	0.0976	$2.38x10^{-9}$	
u	1100	1.20		
1100 ppm ± 1.20				

Table 0.38. The uncertainty of 4,4'-DDT in subgroup 12 for mixture II of mix A

group12 (1100 ppm 2000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1642.4
Weight of solvent	357.6

	Value(X)	*u(X)*	
heptachlor	124.4	$2.94x10^{-2}$	$8.67x10^{-4}$
4,4'-DDT	125.4	$2.94x10^{-2}$	$8.67x10^{-4}$
metazachlor	185.5	$2.94x10^{-2}$	$8.67x10^{-4}$
benalaxyl	185.5	$2.94x10^{-2}$	$8.67x10^{-4}$
benfluralin	124.4	$2.94x10^{-2}$	$8.67x10^{-4}$
tetradifon	277.2	$2.94x10^{-2}$	$8.67x10^{-4}$
spiromesifen	124.4	$2.94x10^{-2}$	$8.67x10^{-4}$
quinoxyfen	185.5	$2.94x10^{-2}$	$8.67x10^{-4}$
azinphos-ethyl	185.5	$2.94x10^{-2}$	$8.67x10^{-4}$
esfenveralate	124.4	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	357.6	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0976		
2000 mg ± 0.0976			

$$C1 = \frac{C2 * W2}{W1}$$

For uncertainty of 4,4'-DDT in subgroup

C1*W1=C2*W2

$$1400\ ppm\ \pm ? = \frac{(17681.73\ ppm \pm 13.26) * (158.26\ mg \pm 0.0294)}{2000\ mg \pm 0.0833}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of 4,4'-DDT (ind. soln)	17681.7	12.64	$5.11x10^{-7}$	$7.54x10^{-4}$
Amount of 4,4'-DDT	125.4	$2.94x10^{-2}$	$5.51x10^{-8}$	
Solvent	2000	0.0976	$2.38x10^{-9}$	
u	1109	0.84		
1109 ppm ± 0.84				

Table 0.39. The uncertainty of *alpha*-HCH in subgroup 13 for mixture II of mix A

group13 (1400 ppm 2000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1475.8
Weight of solvent	524.2

	Value(X)	*u(X)*	
alpha-HCH	158.4	$2.94x10^{-2}$	$8.67x10^{-4}$
beta-endosulfan	169.5	$2.94x10^{-2}$	$8.67x10^{-4}$
diclofop-methyl	236.1	$2.94x10^{-2}$	$8.67x10^{-4}$
ethalfluralin	167.5	$2.94x10^{-2}$	$8.67x10^{-4}$
dichloran (DCNA; Ditranil)	226.8	$2.94x10^{-2}$	$8.67x10^{-4}$
chlordecone (kepone)	167.5	$2.94x10^{-2}$	$8.67x10^{-4}$
profenofos	350.0	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	524.2	$2.94x10^{-2}$	$8.67x10^{-4}$
u		0.0833	
2000 mg ± 0.0833			

For uncertainty of *alpha*-HCH in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$1400\ ppm\ \pm ? = \frac{(17681.73\ ppm \pm 13.26) * (158.26\ mg \pm 0.0294)}{2000\ mg \pm 0.0833}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of *alpha*-HCH (ind. soln)	17681.7	13.26	$5.623x10^{-7}$	
Amount of *alpha*-HCH	158.4	$2.94x10^{-2}$	$3.46x10^{-8}$	$7.74x10^{-4}$
Solvent	2000	0.0833	$1.73x10^{-9}$	
u	1400	1.08		
1400 ppm ± 1.08				

Table 0.40. The uncertainty of *beta*-Endosulfan in subgroup 13 for mixture II of mix A

group13 (1400 ppm 2000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1475.8
Weight of solvent	524.2

	Value(X)	*u(X)*	
alpha-HCH	158.4	$2.94x10^{-2}$	$8.67x10^{-4}$
beta-endosulfan	169.5	$2.94x10^{-2}$	$8.67x10^{-4}$
diclofop-methyl	236.1	$2.94x10^{-2}$	$8.67x10^{-4}$
ethalfluralin	167.5	$2.94x10^{-2}$	$8.67x10^{-4}$
dichloran (DCNA; Ditranil)	226.8	$2.94x10^{-2}$	$8.67x10^{-4}$
chlordecone (kepone)	167.5	$2.94x10^{-2}$	$8.67x10^{-4}$
profenofos	350.0	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	524.2	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0833		
2000 mg ± 0.0833			

For uncertainty of beta-endosulfan in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$1417\ ppm\ \pm\ ? = \frac{(16715.8ppm\ \pm\ 1"8.72) * (169.51\ mg\ \pm 0.0294)}{2000\ mg\ \pm 0.0833}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of *beta*- endosulfan (ind. soln)	16715.8	18.72	$1.25x10^{-6}$	$1.13x10^{-3}$
Amount of *beta*-endosulfan	169.5	$2.94x10^{-2}$	$3.02x10^{-8}$	
Solvent	2000	0.08	$1.73x10^{-9}$	
u	1417	1.61		
1417 ppm ± 1.61				

Table 0.41. The uncertainty of 2,4'-DDT in subgroup 15 for mixture II of mix B

group15 (1800 ppm 1600 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesticides	1405.0
Weight of solvent	195.0

	Value(X)	*u(X)*	
2,4'-DDT	224.4	$2.94x10^{-2}$	$8.67x10^{-4}$
dieldrin	162.9	$2.94x10^{-2}$	$8.67x10^{-4}$
tolylfluanid	224.4	$2.94x10^{-2}$	$8.67x10^{-4}$
diphenylamine (dpa)	208.6	$2.94x10^{-2}$	$8.67x10^{-4}$
aclonifen	194.9	$2.94x10^{-2}$	$8.67x10^{-4}$
dimethachlor	194.9	$2.94x10^{-2}$	$8.67x10^{-4}$
endosulfan sulfate	194.9	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	195.0	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0833		
1600 mg ± 0.0833			

For uncertainty of 2,4'-DDT in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$1300\ ppm\ \pm ? = \frac{(12833.2\ \text{ppm} \pm 22.69) * (224.42\ mg \pm 0.0294)}{1600\ mg \pm 0.0833}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of 2,4'-DDT (ind. soln)	12833.2	22.69	$3.13x10^{-6}$	
Amount of 2,4'-DDT	224.4	$2.94x10^{-2}$	$1.72x10^{-8}$	$1.77x10^{-3}$
Solvent	1600	0.0833	$2.71x10^{-9}$	
u	1800	3.19		
1800 ppm ± 3.19				

Table 0.42. The uncertainty of Dieldrin in subgroup 13 for mixture II of mix B

group15 (1800 ppm 1600 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of pesti-cides	1405.0
Weight of solvent	195.0

	Value(X)	*u(X)*	
2,4'-DDT	224.4	$2.94x10^{-2}$	$8.67x10^{-4}$
dieldrin	162.9	$2.94x10^{-2}$	$8.67x10^{-4}$
tolylfluanid	224.4	$2.94x10^{-2}$	$8.67x10^{-4}$
diphenylamine (dpa)	208.6	$2.94x10^{-2}$	$8.67x10^{-4}$
aclonifen	194.9	$2.94x10^{-2}$	$8.67x10^{-4}$
dimethachlor	194.9	$2.94x10^{-2}$	$8.67x10^{-4}$
endosulfan sulfate	194.9	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	195.0	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0833		
1600 mg ± 0.0833			

For uncertainty of dieldrin in subgroup

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$1800\ ppm\ \pm\ ? = \frac{(17681.73\ ppm \pm 14.81) * (162.88\ mg \pm 0.0294)}{1600\ mg \pm 0.0833}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2 + \ldots [X/u(x)]_n^2}$
Concentration of dieldrin (ind. soln)	17681.7	14.81	$7.02x10^{-7}$	$8.58x10^{-4}$
Amount of dieldrin	162.9	$2.94x10^{-2}$	$3.27x10^{-8}$	
Solvent	1600	0.0833	$2.71x10^{-9}$	
u	1800	1.55		
1800 ppm ± 1.55				

Table 0.43. The uncertainty of Endrin in subgroup 7 for mixture I of mix C

Total volume of materials	1.57
Volume of solvent	0.32

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
endrin	0.19	$2.47\text{x}10^{-3}$	$6.11\text{x}10^{-6}$
aldrin	0.25	$2.49\text{x}10^{-3}$	$6.18\text{x}10^{-6}$
chlorthal-dimethyl (dcpa. tctp, dacthal)	0.57	$2.66\text{x}10^{-3}$	$7.08\text{x}10^{-6}$
nitrofen	0.47	$2.60\text{x}10^{-3}$	$6.75\text{x}10^{-6}$
biphenyl	0.10	$2.45\text{x}10^{-3}$	$6.03\text{x}10^{-6}$
Volume of solvent	0.32	$2.52\text{x}10^{-3}$	$6.34\text{x}10^{-6}$
u	0.006		

1.90 mL ± 0.006

endrin				Standard Uncer-tainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^{0}C	3	Triangular distribution	$3.27\text{x}10^{-4}$	$2.47\text{x}10^{-3}$
	The coefficient of volume expansion for ace-tonitrile $^0C^{-1}$	$1.40\text{x}10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	0.19			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of endrin in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$1184\ ppm\ \pm ? = \frac{(11790\ ppm\ \pm 25.5)*(0.19\ mL\ \pm 0{,}00247)}{1.90\ mL\ \pm 0{,}006}$

	X	u(x)			
Concentration of endrin (ind. soln)	11790	25.50	$4.68\text{x}10^{-6}$	$1.35\text{x}10^{-2}$	1184 ppm ± 16
Amount of endrin	0.19	$2.47\text{x}10^{-3}$	$1.68\text{x}10^{-4}$		
Solvent	1.9	0.006	$9.97\text{x}10^{-6}$		
u	1184	16.00			

Table 0.44. The uncertainty of Aldrin in subgroup 7 for mixture II of mix C

Total volume of materials	1.57
Volume of solvent	0.32

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
endrin	0.19	$2.47x10^{-3}$	$6.11x10^{-6}$
aldrin	0.25	$2.49x10^{-3}$	$6.18x10^{-6}$
chlorthal-dimethyl (dcpa, tctp, dacthal)	0.57	$2.66x10^{-3}$	$7.08x10^{-6}$
nitrofen	0.47	$2.60x10^{-3}$	$6.75x10^{-6}$
biphenyl	0.10	$2.45x10^{-3}$	$6.03x10^{-6}$
Volume of solvent	0.32	$2.52x10^{-3}$	$6.34x10^{-6}$
u	0.006		

1.90 mL ± 0.006

aldrin				Standard Uncertainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^0C	3	Triangular distribution	$4.21x10^{-4}$	$2.49x10^{-3}$
	The coefficient of volume expansion for acetonitrile $^0C^{-1}$	$1.40x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	0.25			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of aldrin in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$$1208\ ppm\ \pm ? = \frac{(9320.16\ ppm\ \pm 23.1)*(0.25\ mL\ \pm 0.00249)}{1.90\ mL\ \pm 0.006}$$

	X	u(x)			
Concentration of aldrin (ind. soln)	9320.16	23.10	$6.14x10^{-6}$	$1.35x10^{-2}$	1208 ppm ± 13.1
Amount of aldrin	0.25	$2.49x10^{-3}$	$1.02x10^{-4}$		
Solvent	1.9	0.006	$9.97x10^{-6}$		
u	1208	13.14			

Table 0.45. The uncertainty of 4,4'-DDD in subgroup 10 for mixture II of mix C

Total volume of materials	2.04
Volume of solvent	0.49

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
4,4'-DDD	0.29	$2.50x10^{-3}$	$6.25x10^{-6}$
4,4'-DDE	0.28	$2.50x10^{-3}$	$6.23x10^{-6}$
diflufenican	0.28	$2.50x10^{-3}$	$6.23x10^{-6}$
HCH-beta (Beta BHC)	0.28	$2.50x10^{-3}$	$6.25x10^{-6}$
2.4'-DDD	0.14	$2.46x10^{-3}$	$6.06x10^{-6}$
cyhalothrin-lambda	0.11	$2.46x10^{-3}$	$6.04x10^{-6}$
methoxychlor	0.26	$2.49x10^{-3}$	$6.20x10^{-6}$
2.4'-DDE	0.25	$2.49x10^{-3}$	$6.19x10^{-6}$
flurochloridone	0.14	$2.46x10^{-3}$	$6.06x10^{-6}$
Volume of solvent	0.49	$2.60x10^{-3}$	$6.76x10^{-6}$
u	0.008		

2.53 mL ± 0.008

4,4'-DDD				Standard Uncer-tainty	Standard Un-certainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^0C	3	Triangular distribution	$5.0x10^{-4}$	$2.50x10^{-3}$
	The coefficient of volume expansion for ace-tonitrile $^0C^{-1}$	$1.40x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	0.29			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of 4,4'-DDD in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$$856\ ppm\ \pm ? = \frac{(7467\ ppm\ \pm 26.4) * (0.29\ mL\ \pm 0.003)}{2.53\ mL\ \pm 0.006}$$

	X	u(x)			
Concentration of 4,4'-DDD (ind. soln)	7467	26.40	$1.25x10^{-5}$	$9.86x10^{-3}$	856 ppm ± 8.44
Amount of 4,4'-DDD	0.3	$2.51x10^{-3}$	$7.46x10^{-5}$		
Solvent	2.53	0.008	$1.00x10^{-5}$		
u	856	8.44			

Table 0.46. The uncertainty of *gamma*-HCH in subgroup 11 for mixture II of mix C

Total volume of materials	2.164
Volume of solvent	0.37

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
gamma-HCH	0.25	$2.49x10^{-3}$	$6.19x10^{-6}$
alpha-endosulfan	0.14	$2.46x10^{-3}$	$6.06x10^{-6}$
dicofol (kelthane)	0.25	$2.49x10^{-3}$	$6.19x10^{-6}$
cypermethrin-alpha (alphamethrin)	0.14	$2.46x10^{-3}$	$6.06x10^{-6}$
cyhalofop-butyl	0.15	$2.46x10^{-3}$	$6.06x10^{-6}$
trifluralin	0.14	$2.46x10^{-3}$	$6.06x10^{-6}$
vinclozolin	0.35	$2.52x10^{-3}$	$6.36x10^{-6}$
2-Phenylphenol (Ortho phenylphenol)	0.23	$2.49x10^{-3}$	$6.18x10^{-6}$
oxadiazon	0.16	$2.46x10^{-3}$	$6.07x10^{-6}$
bitertanol (biloxazol) (mixture of izomers and diastomers)	0.35	$2.52x10^{-3}$	$6.36x10^{-6}$
Volume of solvent	0.37	$2.54x10^{-3}$	$6.43x10^{-6}$
u	0.008		

2.53 mL ± 0.008

gamma-HCH				Standard Uncertainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^0C	3	Triangular distribution	$4.35x10^{-4}$	$2.49x10^{-3}$
	The coefficient of volume expansion for acetonitrile $^0C^{-1}$	$1.40x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	0.25			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of *gamma*-HCH in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$$870\ ppm\ \pm ?=\frac{(8646\ ppm\ \pm 26.5)*(0.25\ mL\ \pm 0.00249)}{2.53\ mL\ \pm 0.008}$$

	X	u(x)			
Concentration of *gamma*-HCH (ind. soln)	8646	26.50	$9.39x10^{-6}$	$1.07x10^{-2}$	870 ppm ± 9.32
Amount of *gamma*-HCH	0.25	$2.49x10^{-3}$	$9.56x10^{-5}$		
Solvent	2.53	0.008	$1.00x10^{-5}$		
u	870	9.32			

Table 0.47. The uncertainty of *alpha*-Endosulfan in subgroup 11 for mixture II of mix C

Total volume of materials	2.164
Volume of solvent	0.37

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
gamma-HCH	0.25	$2.49x10^{-3}$	$6.19x10^{-6}$
alpha-endosulfan	0.14	$2.46x10^{-3}$	$6.06x10^{-6}$
dicofol (kelthane)	0.25	$2.49x10^{-3}$	$6.19x10^{-6}$
cypermethrin-alpha (alphamethrin)	0.14	$2.46x10^{-3}$	$6.06x10^{-6}$
cyhalofop-butyl	0.15	$2.46x10^{-3}$	$6.06x10^{-6}$
trifluralin	0.14	$2.46x10^{-3}$	$6.06x10^{-6}$
vinclozolin	0.35	$2.52x10^{-3}$	$6.36x10^{-6}$
2-Phenylphenol (Ortho phenylphenol)	0.23	$2.49x10^{-3}$	$6.18x10^{-6}$
oxadiazon	0.16	$2.46x10^{-3}$	$6.07x10^{-6}$
bitertanol (biloxazol) (mixture of izomers and diastomers)	0.35	$2.52x10^{-3}$	$6.36x10^{-6}$
Volume of solvent	0.37	$2.54x10^{-3}$	$6.43x10^{-6}$
u	0.008		

2.53 mL ± 0.008

alpha- endosulfan				Standard Uncer-tainty	Standard Uncertainty u(V) of Vol-ume
Volume of the pipette	Temperature change in the lab. ^0C	3	Triangular distribution	$2.42x10^{-4}$	$2.46x10^{-3}$
	The coefficient of volume expansion for acetonitrile $^0C^{-1}$	$1.40x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	0.14			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of *alpha*- endosulfan in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$877\ ppm\ \pm ? = \frac{(15720\ ppm \pm 36.4) * (0.14\ mL \pm 0.00246)}{2.53\ mL \pm 0.008}$

	X	u(x)			
Concentration of *alpha*- endosulfan (ind. soln)	15720	36.40	$5.36x10^{-6}$	$1.79x10^{-2}$	877 ppm ± 15.68
Amount of *alpha*- endosulfan	0.14	$2.46x10^{-3}$	$3.04x10^{-4}$		
Solvent	2.53	0.008	$1.00x10^{-5}$		
u	877	15.68			

Table 0.48. The uncertainty of Heptachlor in subgroup 12 for mixture II of mix C

Total volume of materials	2.06
Volume of solvent	0.47

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
heptachlor	0.16	$2.46x10^{-3}$	$6.07x10^{-6}$
4,4'-DDT	0.16	$2.46x10^{-3}$	$6.07x10^{-6}$
metazachlor	0.23	$2.48x10^{-3}$	$6.16x10^{-6}$
benalaxyl	0.23	$2.49x10^{-3}$	$6.18x10^{-6}$
benfluralin	0.16	$2.46x10^{-3}$	$6.07x10^{-6}$
tetradifon	0.35	$2.52x10^{-3}$	$6.36x10^{-6}$
spiromesifen	0.16	$2.46x10^{-3}$	$6.07x10^{-6}$
quinoxyfen	0.23	$2.48x10^{-3}$	$6.16x10^{-6}$
azinphos-ethyl	0.23	$2.48x10^{-3}$	$6.16x10^{-6}$
esfenveralate	0.16	$2.46x10^{-3}$	$6.07x10^{-6}$
volume of solvent	0.47	$2.58x10^{-3}$	$6.64x10^{-6}$
u	0.008		

2.53 mL ± 0.008

heptachlor				Standard Uncertainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^0C	3	Triangular distribution	$2.66x10^{-4}$	$2.46x10^{-3}$
	The coefficient of volume expansion for acetonitrile $^0C^{-1}$	$1.40x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	0.16			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of heptachlor in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$870\ ppm\ \pm ? = \frac{(14148\ ppm \pm 33.6) * (0.16\ mL \pm 0.00246)}{2.53\ mL \pm 0.008}$

	X	u(x)			
Concentration of heptachlor (ind. soln)	14148	33.60	$5.64x10^{-6}$	$1.63x10^{-2}$	870 ppm ± 14.20
Amount of heptachlor	0.16	$2.46x10^{-3}$	$2.51x10^{-4}$		
Solvent	2.53	0.008	$1.00x10^{-5}$		
u	870	14.20			

Table 0.49. The uncertainty of 4,4'-DDT in subgroup 12 for mixture II of mix C

Total volume of materials	2.06
Volume of solvent	0.47

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
heptachlor	0.16	$2.46x10^{-3}$	$6.07x10^{-6}$
4,4'-DDT	0.16	$2.46x10^{-3}$	$6.07x10^{-6}$
metazachlor	0.23	$2.48x10^{-3}$	$6.16x10^{-6}$
benalaxyl	0.23	$2.49x10^{-3}$	$6.18x10^{-6}$
benfluralin	0.16	$2.46x10^{-3}$	$6.07x10^{-6}$
tetradifon	0.35	$2.52x10^{-3}$	$6.36x10^{-6}$
spiromesifen	0.16	$2.46x10^{-3}$	$6.07x10^{-6}$
quinoxyfen	0.23	$2.48x10^{-3}$	$6.16x10^{-6}$
azinphos-ethyl	0.23	$2.48x10^{-3}$	$6.16x10^{-6}$
esfenveralate	0.16	$2.46x10^{-3}$	$6.07x10^{-6}$
volume of solvent	0.47	$2.58x10^{-3}$	$6.64x10^{-6}$
u	0.008		

2.53 mL ± 0.008

4,4'-DDT				Standard Uncertainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^0C	3	Triangular distribution	$2.73x10^{-4}$	$2.46x10^{-3}$
	The coefficient of volume expansion for acetonitrile $^0C^{-1}$	$1.40x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	0.16			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of 4,4'-DDT in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$$891\ ppm\ \pm ?=\frac{(14148\ ppm\ \pm 28.8)*(0.16\ mL\ \pm 0.00246)}{2.53\ mL\ \pm 0{,}008}$$

	X	u(x)			
Concentration of 4,4'-DDT (ind. soln)	14148	28.80	$4.14x10^{-6}$	$1.59x10^{-2}$	891 ppm ± 14.18
Amount of 4,4'-DDT	0.16	$2.46x10^{-3}$	$2.39x10^{-4}$		
Solvent	2.53	0.008	$1.00x10^{-5}$		
u	891	14.18			

Table 0.50. The uncertainty of *alpha*-HCH in subgroup 13 for mixture II of mix C

Total volume of materials	1.73
Volume of solvent	0.80

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
alpha-HCH	0.18	$2.47x10^{-3}$	$6.10x10^{-6}$
beta-endosulfan	0.19	$2.47x10^{-3}$	$6.11x10^{-6}$
diclofop-methyl	0.28	$2.49x10^{-3}$	$6.22x10^{-6}$
ethalfluralin	0.19	$2.47x10^{-3}$	$6.11x10^{-6}$
dichloran (DCNA; Ditranil)	0.27	$2.49x10^{-3}$	$6.21x10^{-6}$
chlordecone (kepone)	0.19	$2.47x10^{-3}$	$6.11x10^{-6}$
profenofos	0.42	$2.52x10^{-3}$	$6.35x10^{-6}$
Volume of solvent	0.80	$2.84x10^{-3}$	$8.05x10^{-6}$
u	0.007		

2.53 mL ± 0.007

alp*ha*-HCH				Standard Uncertainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^0C	3	Triangular distribution	$3.14x10^{-4}$	$2.47x10^{-3}$
	The coefficient of volume expansion for acetonitrile $^0C^{-1}$	$1.40x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	0.18			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of alpha-HCH in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$$1028\,ppm \pm ? = \frac{(14148\,ppm \pm 29.2) * (0.18\ mL \pm 0.00247)}{2.53\,mL \pm 0.007}$$

	X	u(x)			
Concentration of alpha-HCH (ind. soln)	14148	29.20	$4.26x10^{-6}$	$1.39x10^{-2}$	1028 ppm ± 14.26
Amount of *alpha*-HCH	0.18	$2.47x10^{-3}$	$1.81x10^{-4}$		
Solvent	2.53	0.007	$7.66x10^{-6}$		
u	1028	14.26			

Table 0.51. The uncertainty of *beta*-Endosulfan in subgroup 13 for mixture II of mix C

Total volume of materials	1.73
Volume of solvent	0.80

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
alpha-HCH	0.18	$2.47x10^{-3}$	$6.10x10^{-6}$
beta-endosulfan	0.19	$2.47x10^{-3}$	$6.11x10^{-6}$
diclofop-methyl	0.28	$2.49x10^{-3}$	$6.22x10^{-6}$
ethalfluralin	0.19	$2.47x10^{-3}$	$6.11x10^{-6}$
dichloran (DCNA; Ditranil)	0.27	$2.49x10^{-3}$	$6.21x10^{-6}$
chlordecone (kepone)	0.19	$2.47x10^{-3}$	$6.11x10^{-6}$
profenofos	0.42	$2.52x10^{-3}$	$6.35x10^{-6}$
Volume of solvent	0.80	$2.84x10^{-3}$	$8.05x10^{-6}$
u	0.007		

2.53 mL ± 0.007

beta-endosulfan				Standard Uncertainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^0C	3	Triangular distribution	$3.33x10^{-4}$	$2.47x10^{-3}$
	The coefficient of volume expansion for acetonitrile $^0C^{-1}$	$1.40x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	0.19			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of *beta*-ndosulfan in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$$1028\ ppm\ \pm ? = \frac{(13362\ ppm\ \pm 32.0) * (0.19\ mL\ \pm 0.00247)}{2.53\ mL\ \pm 0.007}$$

	X	u(x)			
Concentration of *beta*-endosulfan (ind. soln)	13362	32.00	$5.74x10^{-6}$	$1.32x10^{-2}$	1028 ppm ± 13.59
Amount of *beta*-endosulfan	0.19	$2.47x10^{-3}$	$1.61x10^{-4}$		
Solvent	2.53	0.007	$7.66x10^{-6}$		
u	1028	13.59			

Table 0.52. The uncertainty of 2,4'-DDT in subgroup 15 for mixture II of mix C

				Uncertainty for solvent:		
Total volume of materials	1.77			*Value(X)*	*u(X)*	
Volume of solvent	0.25		2,4'-DDT	0.28	$2.50x10^{-3}$	$6.23x10^{-6}$
$\frac{0.006}{\sqrt{6}}$=0.002			dieldrin	0.20	$2.47x10^{-3}$	$6.12x10^{-6}$
			tolylfluanid	0.28	$2.49x10^{-3}$	$6.22x10^{-6}$
			diphenylamine (DPA)	0.26	$2.49x10^{-3}$	$6.20x10^{-6}$
			aclonifen	0.25	$2.49x10^{-3}$	$6.18x10^{-6}$
			dimethachlor	0.24	$2.48x10^{-3}$	$6.17x10^{-6}$
			endosulfan sulfate	0.24	$2.48x10^{-3}$	$6.17x10^{-6}$
			Volume of solvent	0.25	$2.49x10^{-3}$	$6.21x10^{-6}$
			u	0.007		
		2.02 mL ± 0.007				
2,4'-DDT					Standard Uncertainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^0C	3	Triangular distribution		$4.82x10^{-4}$	$2.50x10^{-3}$
	The coefficient of volume expansion for acetonitrile $^0C^{-1}$	$1.40x10^{-3}$				
	Volume of the pipette (0.5-5 mL), ml	0.28				
	Cal uncertainty of the pipette, ml	0.002				
For uncertainty of 2,4'-DDTin subgroup	C1=(C2∗W2)/W1	$1426\,ppm \pm ? = \frac{(10218\,ppm \pm 29.5)*(0.28\ mL \pm 0.00250)}{2.02\,mL \pm 0.007}$				
C1*W1=C2*W2						
	X	u(x)				
Concentration of 2,4'-DDT (ind. soln)	10218	29.50	$8.34x10^{-6}$	$9.94x10^{-3}$	1426 ppm ± 14.17	
Amount of 2,4'-DDT	0.28	$2.50x10^{-3}$	$7.85x10^{-5}$			
Solvent	2.02	0.007	$1.20x10^{-5}$			
u	1426	14.17				

Table 0.53. The uncertainty of Dieldrin subgroup 15 for mixture II of mix C

Total volume of materials	1.73
Volume of solvent	0.80

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
2,4'-DDT	0.28	$2.50x10^{-3}$	$6.23x10^{-6}$
dieldrin	0.20	$2.47x10^{-3}$	$6.12x10^{-6}$
tolylfluanid	0.28	$2.49x10^{-3}$	$6.22x10^{-6}$
diphenylamine (DPA)	0.26	$2.49x10^{-3}$	$6.20x10^{-6}$
aclonifen	0.25	$2.49x10^{-3}$	$6.18x10^{-6}$
dimethachlor	0.24	$2.48x10^{-3}$	$6.17x10^{-6}$
endosulfan sulfate	0.24	$2.48x10^{-3}$	$6.17x10^{-6}$
Volume of solvent	0.25	$2.49x10^{-3}$	$6.21x10^{-6}$
u	0.007		

2.02 mL ± 0.007

dieldrin				Standard Uncertainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^0C	3	Triangular distribution	$3.50x10^{-4}$	$2.47x10^{-3}$
	The coefficient of volume expansion for acetonitrile $^0C^{-1}$	$1.40x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	0.20			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of dieldrin in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$$1426\ ppm\ \pm ? = \frac{(10218\ ppm\ \pm 29.5) * (0.28\ mL\ \pm 0.00250)}{2.02\ mL\ \pm 0.007}$$

	X	u(x)			
Concentration of dieldrin (ind. soln)	14148	30.40	$4.62x10^{-6}$	$1.27x10^{-2}$	1435 ppm ± 18.29
Amount of dieldrin	0.20	$2.47x10^{-3}$	$1.46x10^{-4}$		
Solvent	2.02	0.007	$1.20x10^{-5}$		
u	1435	18.29			

APPENDIX 4 Uncertainty of Characterization of Pesticides in Mix B and Mix C

Table 0.54. Characterization of HCB in mixture I of mix B

mix B-mixture I (100 ppm 7000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021 Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$
Total weight of groups	4491.7
Weight of solvent	2508.3

	Value(X)	*u(X)*	
group 1	1166.7	$2.94x10^{-2}$	$8.67x10^{-4}$
group 2	700.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 3	875.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 16	1750.0	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	2508.3	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0658		
7000 mg ± 0.0658			

For uncertainty of HCB in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$100\ ppm\ \pm\ ? = \frac{(400\ ppm \pm 1.00) * (1750\ mg \pm 0.0294)}{7000\ mg \pm 0.0658}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of HCB (group 16)	400	1.00	$6.25x10^{-6}$	$2.50x10^{-3}$
Amount of HCB	1750	$2.94x10^{-2}$	$2.83x10^{-10}$	
Solvent	7000	0.0658	$8.84x10^{-11}$	
u	100	0.25		
100 ppm ± 0.25				

Table 0.55. Characterization of Metolachlor in mixture I of mix B

mix B-mixture I (100 ppm 7000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$
Total weight of groups	4491.7
Weight of solvent	2508.3

	Value(X)	*u(X)*	
group 1	1166.7	$2.94x10^{-2}$	$8.67x10^{-4}$
group 2	700.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 3	875.0	$2.94x10^{-2}$	$8.67x10^{-4}$
group 16	1750.0	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	2508.3	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.0658		
7000 mg ± 0.0658			

For uncertainty of metalochlor in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$100\ ppm\ \pm\ ? = \frac{(1004\ ppm\ \pm 0.18) * (700\ mg\ \pm 0.0294)}{7000\ mg\ \pm 0.0658}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of metolachlor (group 2)	1004	0.18	$3.21\ x10^{-8}$	$1.45x10^{-4}$
Amount of metolachlor	700	$2.94x10^{-2}$	$1.77x10^{-9}$	
Solvent	7000	0.0658	$8.84x10^{-11}$	
u	100	0.02		
100 ppm ± 0.02				

Table 0.56. Characterization of Heptachlor-*endo*-epoxide in mixture II of mix B

mix B-mixture II (100 ppm 5000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of groups	4853.1
Weight of solvent	146.9

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	500	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	312.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	454.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	454.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	455.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	359.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	277.8	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	146.9	$2.94x10^{-2}$	$8.67x10^{-4}$
u		0.106	

5000 mg ± 0.106

For uncertainty of heptachlor-endo-epoxide in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1} 100\ ppm\ \pm ? = \frac{(1400\ ppm \pm 2.74) * (357.14\ mg \pm 0.0294)}{5000\ mg \pm 0.106}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of heptachlor-*endo*-epoxide (group 5)	1400	2.74	$3.83x10^{-6}$	$1.96x10^{-3}$
Amount of heptachlor-*endo*-epoxide	357.1	$2.94x10^{-2}$	$6.79x10^{-9}$	
Solvent	5000	0.106	$4.49x10^{-10}$	
u	100	0.20		

100 ppm ± 0.20

Table 0.57. Characterization of Endrin in mixture II of mix B

mix B-mixture II (100 ppm 5000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of groups	4853.1
Weight of solvent	146.9

	Value(X)	*u(X)*	
group 4	500	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	312.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	454.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	454.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	455.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	359.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	277.8	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	146.9	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
5000 mg ± 0.106			

For uncertainty of endrin in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$100\ ppm\ \pm\ ? = \frac{(900\ ppm\ \pm 0.96) * (555.6\ mg\ \pm 0.0294)}{5000\ mg\ \pm 0.106}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of endrin (group 7)	900	0.96	$1.14x10^{-6}$	$1.07x10^{-3}$
Amount of endrin	555.6	$2.94x10^{-2}$	$2.81x10^{-9}$	
Solvent	5000	0.106	$4.49x10^{-10}$	
u	100	0.11		
100 ppm ± 0.11				

Table 0.58. Characterization of Aldrin in mixture II of mix B

mix B-mixture II (100 ppm 5000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of groups	4853.1
Weight of solvent	146.9

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	500	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	312.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	454.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	454.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	455.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	359.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	277.8	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	146.9	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
5000 mg ± 0.106			

For uncertainty of aldrin in mixture

C1*W1=C2*W2

$C1 = \frac{C2 * W2}{W1}$

$100\ ppm\ \pm\ ? = \frac{(900\ ppm\ \pm\ 1.33) * (555.6 mg\ \pm 0.0294)}{5000\ mg\ \pm 0.106}$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of aldrin (group 7)	900	1.33	$2.18x10^{-6}$	$1.48x10^{-3}$
Amount of aldrin	555.6	$2.94x10^{-2}$	$2.81x10^{-9}$	
Solvent	5000	0.106	$4.49x10^{-10}$	
u	100	0.15		
100 ppm ± 0.15				

Table 0.59. Characterization of 4.4'-DDD in mixture II of mix B

mix B-mixture II (100 ppm 5000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of groups	4853.1
Weight of solvent	146.9

	Value(X)	*u(X)*	
group 4	500	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	312.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	454.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	454.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	455.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	359.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	277.8	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	146.9	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
5000 mg ± 0.106			

For uncertainty of 4,4'-DDD in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$100\ ppm\ \pm ? = \frac{(1100\ ppm \pm 2.90) * (454.55 mg \pm 0.0294)}{5000\ mg \pm 0.106}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of 4,4'-DDD (group10)	1100	2.90	$6.95x10^{-6}$	$2.64x10^{-3}$
Amount of 4,4'-DDD	454.5	$2.94x10^{-2}$	$4.19x10^{-9}$	
Solvent	5000	0.106	$4.49x10^{-10}$	
u	100	0.26		
100 ppm ± 0.26				

Table 0.60. Characterization of *gamma*-HCH in mixture II of mix B

mix B-mixture II (100 ppm 5000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of groups	4853.1
Weight of solvent	146.9

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	500	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	312.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	454.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	454.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	455.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	359.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	277.8	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	146.9	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
5000 mg ± 0.106			

For uncertainty of *gamma*-HCH in mixture

C1*W1=C2*W2

$C1 = \frac{C2 * W2}{W1}$ $100\ ppm\ \pm ? = \frac{(1100\ ppm\ \pm 2.28) * (454.6\ mg\ \pm 0.0294)}{5000\ mg\ \pm 0.106}$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of *gamma*-HCH (group 11)	1100	2.28	$4.30x10^{-6}$	$2.07x10^{-3}$
Amount of *gamma*-HCH	454.6	$2.94x10^{-2}$	$4.19x10^{-9}$	
Solvent	5000	0.106	$4.49x10^{-10}$	
u	100	0.21		
100 ppm ± 0.21				

Table 0.61. Characterization of *alpha*-Endosulfan in mixture II of mix B

mix B-mixture II (100 ppm 5000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertatinity	$2.94x10^{-2}$

Total weight of groups	4853.1
Weight of solvent	146.9

	Value(X)	*u(X)*	
group 4	500	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	312.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	454.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	454.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	455.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	359.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	277.8	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	146.9	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
5000 mg ± 0.106			

For uncertainty of *alpha*-endosulfan in mixture

C1*W1=C2*W2

$C1 = \frac{C2 * W2}{W1}$ $101\ ppm\ \pm ? = \frac{(1110\ ppm\ \pm 1.10) * (454.55\ mg\ \pm 0.0294)}{5000\ mg\ \pm 0.106}$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2 + \ldots [X/u(x)]_n^2}$
Concentration of alpha-endosulfan (group11)	1110	1.10	$9.82x10^{-7}$	$9.93x10^{-4}$
Amount of alpha-endosulfan	454.5	$2.94x10^{-2}$	$4.19x10^{-9}$	
Solvent	5000	0.106	$4.49x10^{-10}$	
u	101	0.10		
101 ppm ± 0.10				

Table 0.62. Characterization of Heptachlor in mixture II of mix B

mix B-mixture II (100 ppm 5000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertatinity	$2.94x10^{-2}$
Total weight of groups	4853.1
Weight of solvent	146.9

	Value(X)	*u(X)*	
group 4	500	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	312.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	454.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	454.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	455.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	359.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	277.8	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	146.9	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
5000 mg ± 0.106			

For uncertainty of heptachlor in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$100\ ppm\ \pm ? = \frac{(1100\ ppm \pm 1.20) * (455.5\ mg \pm 0.0294)}{5000\ mg \pm 0.106}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of heptachlor (group 12)	1100	1.20	$1.19x10^{-6}$	$1.09x10^{-3}$
Amount of heptachlor	455.5	$2.94x10^{-2}$	$4.18x10^{-9}$	
Solvent	5000	0.106	$4.49x10^{-10}$	
u	100	0.11		
100 ppm ± 0.11				

Table 0.63. Characterization of 4,4'-DDT in mixture II of mix B

mix B-mixture II (100 ppm 5000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertatinity	$2.94x10^{-2}$

Total weight of groups	4853.1
Weight of solvent	146.9

	Value(X)	*u(X)*	
group 4	500	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	312.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	454.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	454.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	455.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	359.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	277.8	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	146.9	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
5000 mg ± 0.106			

For uncertainty of 4,4'-DDT in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$101\ ppm\ \pm\ ? = \frac{(1109\ ppm\ \pm 0.84) * (455.55\ mg\ \pm 0.0294)}{5000\ mg\ \pm 0.106}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of 4,4'-DDT (group 12)	1109	0.84	$5.74x10^{-7}$	$7.60x10^{-4}$
Amount of 4,4'-DDT	455.5	$2.94x10^{-2}$	$4.18x10^{-9}$	
Solvent	5000	0.106	$4.49x10^{-10}$	
u	101	0.08		
101 ppm ± 0.08				

Table 0.64. Characterization of *alpha*-HCH in mixture II of mix B

mix B-mixture II (100 ppm 5000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertatinity	$2.94x10^{-2}$

Total weight of groups	4853.1
Weight of solvent	146.9

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	500	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	312.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	454.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	454.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	455.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	359.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	277.8	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	146.9	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
5000 mg ± 0.106			

For uncertainty of *alpha*-HCH in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$100\ ppm\ \pm ? = \frac{(1400\ ppm \pm 1.08) * (357.1\ mg \pm 0.0294)}{5000\ mg \pm 0.106}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of *alpha*-HCH (group 13)	1400	1.08	$5.95x10^{-7}$	$7.76x10^{-4}$
Amount of *alpha*-HCH	357.1	$2.94x10^{-2}$	$6.79x10^{-9}$	
Solvent	5000	0.106	$4.49x10^{-10}$	
u	100	0.08		
100 ppm ± 0.08				

Table 0.65. Characterization of *beta*-Endosulfan in mixture II of mix B

mix B-mixture II (100 ppm 5000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertatinity	$2.94x10^{-2}$

Total weight of groups	4853.1
Weight of solvent	146.9

	Value(X)	*u(X)*	
group 4	500	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	312.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	454.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	454.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	455.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	359.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	277.8	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	146.9	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
5000 mg ± 0.106			

For uncertainty of beta-endosulfan in mixture

C1*W1=C2*W2

$C1 = \frac{C2 * W2}{W1}$

$101\ ppm\ \pm ? = \frac{(1417\ ppm \pm 1.61) * (357.1 g \pm 0.0294)}{5000\ mg \pm 0.106}$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of beta-endosulfan (group 13)	1417	1.61	$1.29x10^{-6}$	$1.14x10^{-3}$
Amount of beta-endosulfan	357.1	$2.94x10^{-2}$	$6.79x10^{-9}$	
Solvent	5000	0.106	$4.49x10^{-10}$	
u	101	0.12		
101 ppm ± 0.12				

Table 0.66. Characterization of 2,4'-DDT in mixture II of mix B

mix B-mixture II (100 ppm 5000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty for solvent:

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertatinity	$2.94x10^{-2}$

Total weight of groups	4853.1
Weight of solvent	146.9

	Value(X)	*u(X)*	
group 4	500	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	312.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	454.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	454.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	455.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	359.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	277.8	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	146.9	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
5000 mg ± 0.106			

For uncertainty of 2,4'-DDT in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1} \qquad 100\ ppm\ \pm ? = \frac{(1800\ ppm \pm 3.19) * (277.8\ mg \pm 0.0294)}{5000\ mg \pm 0.106}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of 2,4'-DDT (group 12)	1800	3.19	$3.14x10^{-6}$	$1.78x10^{-3}$
Amount of 2,4'-DDT	277.8	$2.94x10^{-2}$	$1.12x10^{-8}$	
Solvent	5000	0.106	4.4910^{-10}	
u	100	0.18		
100 ppm ± 0.18				

Table 0.67. Characterization of Dieldrin in mixture II of mix B

mix B-mixture II (100 ppm 5000 mg)

$\frac{0.036}{\sqrt{3}}$=0.021

Uncertainty of Balance	
Uncertainty component	*u(X)*
Calibration (tare)	0.021
Calibration (sample)	0.021
Combined Uncertainty	$2.94x10^{-2}$

Total weight of groups	4853.1
Weight of solvent	146.9

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	500	$2.94x10^{-2}$	$8.67x10^{-4}$
group 5	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 6	312.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 7	555.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 8	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 9	384.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 10	454.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 11	454.6	$2.94x10^{-2}$	$8.67x10^{-4}$
group 12	455.5	$2.94x10^{-2}$	$8.67x10^{-4}$
group 13	357.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 14	359.1	$2.94x10^{-2}$	$8.67x10^{-4}$
group 15	277.8	$2.94x10^{-2}$	$8.67x10^{-4}$
Weight of solvent	146.9	$2.94x10^{-2}$	$8.67x10^{-4}$
u	0.106		
5000 mg ± 0.106			

For uncertainty of dieldrin in mixture

C1*W1=C2*W2

$$C1 = \frac{C2 * W2}{W1}$$

$$101\ ppm\ \pm\ ? = \frac{(1811\ ppm\ \pm 1.55) * (277.8\ mg\ \pm 0.0294)}{5000\ mg\ \pm 0.106}$$

	X	u(x)	$[X/u(x)]^2$	$\sqrt{[X/u(x)]_i^2+\ldots[X/u(x)]_n^2}$
Concentration of dieldrin (group 13)	1811	1.55	$7.33x10^{-7}$	$8.63x10^{-4}$
Amount of dieldrin	277.8	$2.94x10^{-2}$	$1.12x10^{-8}$	
Solvent	10000	0.106	$4.49x10^{-10}$	
u	101	0.09		
101 ppm ± 0.09				

Table 0.68. The uncertainty of Endrin in mixture II of mix C

Total volume of materials	3.81
Volume of solvent	8.92

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1.27	$3.34x10^{-3}$	$1.11x10^{-5}$
group 5	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 6	0.79	$2.83x10^{-3}$	$8.00x10^{-6}$
group 7	0.84	$2.88x10^{-3}$	$8.28x10^{-6}$
group 8	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 9	1.06	$3.09x10^{-3}$	$9.57x10^{-6}$
group 10	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 11	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 12	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 13	0.97	$3.01x10^{-3}$	$9.03x10^{-6}$
group 14	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 15	0.70	$2.75x10^{-3}$	$7.58x10^{-6}$
Volume of solvent	8.92	$1.55x10^{-2}$	$2.39x10^{-4}$
u	0.02		

12.7 mL ± 0.02

Group 7				Standard Uncertainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^{0}C	3	Triangular distribution	$1.51x10^{-3}$	$2.88x10^{-3}$
	The coefficient of volume expansion for aceton $^0C^{-1}$	$1.46x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	0.84			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of endrin in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$79\ ppm\ \pm ? = \frac{(1184\ ppm\ \pm 16.0) * (0.84\ mL\ \pm 0.00288)}{012.7\ mL\ \pm 0.02}$

	X	u(x)			
Concentration of endrin (ind. soln)	1184	16.0	$1.83x10^{-4}$	$1.40x10^{-2}$	79 ppm ± 1.10
Amount of endrin	0.84	$2.88x10^{-3}$	$1.16x10^{-5}$		
Solvent	12.7	0.02	$2.48x10^{-6}$		
u	79	1.10			

Table 0.69. The uncertainty of Aldrin in mixture II of mix C

Total volume of materials	3.81
Volume of solvent	8.92

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1.27	$3.34x10^{-3}$	$1.11x10^{-5}$
group 5	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 6	0.79	$2.83x10^{-3}$	$8.00x10^{-6}$
group 7	0.84	$2.88x10^{-3}$	$8.28x10^{-6}$
group 8	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 9	1.06	$3.09x10^{-3}$	$9.57x10^{-6}$
group 10	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 11	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 12	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 13	0.97	$3.01x10^{-3}$	$9.03x10^{-6}$
group 14	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 15	0.70	$2.75x10^{-3}$	$7.58x10^{-6}$
Volume of solvent	8.92	$1.55x10^{-2}$	$2.39x10^{-4}$
u	0.02		

12.7 mL ± 0.02

Group 7				Standard Uncertainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^{0}C	3	Triangular distribution	$1.51x10^{-3}$	$2.88x10^{-3}$
	The coefficient of volume expansion for aceton $^0C^{-1}$	$1.46x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	0.84			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of aldrin in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$80\ ppm \pm ? = \frac{(1208\ ppm \pm 13.1) * (0.84\ mL \pm 0.00288)}{12.7\ mL \pm 0.02}$

	X	u(x)			
Concentration of aldrin (ind. soln)	1208	13.1	$1.18x10^{-4}$	$1.15x10^{-2}$	80 ppm ± 0.92
Amount of aldrin	0.84	$2.88x10^{-3}$	$1.16x10^{-5}$		
Solvent	12.7	0.02	$2.48x10^{-6}$		
u	80	0.92			

Table 0.70. The uncertainty of 4,4'-DDD in mixture II of mix C

Total volume of materials	3.81
Volume of solvent	8.92

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1.27	$3.34x10^{-3}$	$1.11x10^{-5}$
group 5	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 6	0.79	$2.83x10^{-3}$	$8.00x10^{-6}$
group 7	0.84	$2.88x10^{-3}$	$8.28x10^{-6}$
group 8	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 9	1.06	$3.09x10^{-3}$	$9.57x10^{-6}$
group 10	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 11	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 12	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 13	0.97	$3.01x10^{-3}$	$9.03x10^{-6}$
group 14	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 15	0.70	$2.75x10^{-3}$	$7.58x10^{-6}$
Volume of solvent	8.92	$1.55x10^{-2}$	$2.39x10^{-4}$
u	0.02		

12.7 mL ± 0.02

Group 10				Standard Un-certainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^{0}C	3	Triangular distribution	$2.06x10^{-3}$	$3.20x10^{-3}$
	The coefficient of volume expansion for aceton $^0C^{-1}$	$1.46x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	1.15			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of 4,4'-DDD in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$78\ ppm\ \pm ? = \frac{(856\ ppm\ \pm 8.4\ mL) * (1.15\ mL\ \pm 0.00320)}{12.7\ \pm 0.02}$

	X	u(x)			
Concentration of 4,4'-DDD (ind. soln)	856	8.4	$9.72x10^{-5}$	$1.04x10^{-2}$	78 ppm ± 0.80
Amount of 4,4'-DDD	1.15	$3.20x10^{-3}$	$7.73x10^{-6}$		
Solvent	12.7	0.02	$2.48x10^{-6}$		
u	78	0.80			

Table 0.71. The uncertainty of *gamma*-HCH in mixture II of mix C

Total volume of materials	3.81
Volume of solvent	8.92

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1.27	$3.34x10^{-3}$	$1.11x10^{-5}$
group 5	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 6	0.79	$2.83x10^{-3}$	$8.00x10^{-6}$
group 7	0.84	$2.88x10^{-3}$	$8.28x10^{-6}$
group 8	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 9	1.06	$3.09x10^{-3}$	$9.57x10^{-6}$
group 10	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 11	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 12	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 13	0.97	$3.01x10^{-3}$	$9.03x10^{-6}$
group 14	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 15	0.70	$2.75x10^{-3}$	$7.58x10^{-6}$
Volume of solvent	8.92	$1.55x10^{-2}$	$2.39x10^{-4}$
u	0.02		

12.7 mL ± 0.02

Group 11				Standard Uncertainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^{0}C	3	Triangular distribution	$2.06x10^{-3}$	$3.20x10^{-3}$
	The coefficient of volume expansion for aceton $^0C^{-1}$	$1.46x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	1.15			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of *gamma*-HCH in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W

$79\ ppm \pm ? = \frac{(870\ ppm \pm 9.3) * (1.15\ mL \pm 0.00320)}{12.7\ mL \pm 0.02}$

	X	u(x)			
Concentration of *gamma*-HCH (ind. soln)	870	9.3	$1.14x10^{-4}$	$1.12x10^{-2}$	79 ppm ± 0.88
Amount of *gamma*-HCH	1.15	$3.20x10^{-3}$	$7.73x10^{-6}$		
Solvent	12.7	0.02	$2.48x10^{-6}$		
u	79	0.88			

Table 0.72. The uncertainty of *alpha*-Endosulfan in mixture II of mix C

Total volume of materials	3.81
Volume of solvent	8.92

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1.27	$3.34x10^{-3}$	$1.11x10^{-5}$
group 5	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 6	0.79	$2.83x10^{-3}$	$8.00x10^{-6}$
group 7	0.84	$2.88x10^{-3}$	$8.28x10^{-6}$
group 8	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 9	1.06	$3.09x10^{-3}$	$9.57x10^{-6}$
group 10	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 11	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 12	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 13	0.97	$3.01x10^{-3}$	$9.03x10^{-6}$
group 14	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 15	0.70	$2.75x10^{-3}$	$7.58x10^{-6}$
Volume of solvent	8.92	$1.55x10^{-2}$	$2.39x10^{-4}$
u	0.02		

12.7 mL ± 0.02

Group 11				Standard Uncertainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^{0}C	3	Triangular distribution	$2.06x10^{-3}$	$3.20x10^{-3}$
	The coefficient of volume expansion for aceton $^0C^{-1}$	$1.46x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	1.15			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of *alpha-endosulfan* in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$79\ ppm \pm ? = \frac{(877\ ppm \pm 15.7) * (1.15\ mL \pm 0.0032($

$12.7\ mL \pm 0.02$

	X	u(x)			
Concentration of *alpha*-endosulfan (ind. soln)	877	15.7	$3.20x10^{-4}$	$1.82x10^{-2}$	79 ppm ± 1.45
Amount of *alpha*-endosulfan	1.15	$3.20x10^{-3}$	$7.73x10^{-6}$		
Solvent	12.7	0.02	$2.48x10^{-6}$		
u	79	1.45			

Table 0.73. The uncertainty of Heptachlor in mixture II of mix C

Total volume of materials	3.81
Volume of solvent	8.92

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1.27	$3.34x10^{-3}$	$1.11x10^{-5}$
group 5	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 6	0.79	$2.83x10^{-3}$	$8.00x10^{-6}$
group 7	0.84	$2.88x10^{-3}$	$8.28x10^{-6}$
group 8	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 9	1.06	$3.09x10^{-3}$	$9.57x10^{-6}$
group 10	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 11	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 12	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 13	0.97	$3.01x10^{-3}$	$9.03x10^{-6}$
group 14	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 15	0.70	$2.75x10^{-3}$	$7.58x10^{-6}$
Volume of solvent	8.92	$1.55x10^{-2}$	$2.39x10^{-4}$
u	0.02		

12.7 mL ± 0.02

Group 12				Standard Un-certainty	Standard Uncer-tainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^0C	3	Triangular distribution	$2.06x10^{-3}$	$3.20x10^{-3}$
	The coefficient of volume expansion for aceton $^0C^{-1}$	$1.46x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	1.15			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of heptachlor in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$79\ ppm \pm ? = \frac{(870\ ppm \pm 14.2) * (1.15\ mL \pm 0.00320)}{12.7\ mL \pm 0.02}$

	X	u(x)			
Concentration of heptachlor (ind. soln)	870	14.2	$2.64x10^{-4}$	$1.66x10^{-2}$	79 ppm ± 1.31
Amount of heptachlor	1.15	$3.20x10^{-3}$	$7.72x10^{-6}$		
Solvent	12.7	0.02	$2.48x10^{-6}$		
u	79	1.31			

Table 0.74. The uncertainty of 4,4’-DDT in mixture II of mix C

Total volume of materials	3.81
Volume of solvent	8.92

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1.27	3.34x10-3	1.11x10-5
group 5	0.90	2.93x10-3	8.61x10-6
group 6	0.79	2.83x10-3	8.00x10-6
group 7	0.84	2.88x10-3	8.28x10-6
group 8	1.15	3.20x10-3	1.02x10-5
group 9	1.06	3.09x10-3	9.57x10-6
group 10	1.15	3.20x10-3	1.02x10-5
group 11	1.15	3.20x10-3	1.02x10-5
group 12	1.15	3.20x10-3	1.02x10-5
group 13	0.97	3.01x10-3	9.03x10-6
group 14	0.90	2.93x10-3	8.61x10-6
group 15	0.70	2.75x10-3	7.58x10-6
Volume of solvent	8.92	1.55x10-2	2.39x10-4
u	0.02		

12.7 mL ± 0.02

Group 12				Standard Un-certainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^{0}C	3	Triangular distribution	2.06x10^{-3}	3.20x10-3
	The coefficient of volume expansion for aceton $^0C^{-1}$	1.46x10-3			
	Volume of the pipette (0.5-5 mL), ml	1.15			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of 4,4’-DDT in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$81\ ppm\ \pm ? = \frac{(891\ ppm\ \pm 14.2)*(1.15\ mL\ \pm 0.00320)}{12.7\ mL\ \pm 0.02}$

	X	u(x)			
Concentration of 4,4’-DDT (ind. soln)	891	14.2	2.54x10-4	1.63x10-2	81 ppm ± 1.31
Amount of 4,4’-DDT	1.15	3.20x10-3	7.72x10-6		
Solvent	12.7	0.02	2.48x10-6		
u	81	1.31			

Table 0.75. The uncertainty of *alpha*-HCH in mixture II of mix C

Total volume of materials	3.81
Volume of solvent	8.92

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1.27	$3.34x10^{-3}$	$1.11x10^{-5}$
group 5	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 6	0.79	$2.83x10^{-3}$	$8.00x10^{-6}$
group 7	0.84	$2.88x10^{-3}$	$8.28x10^{-6}$
group 8	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 9	1.06	$3.09x10^{-3}$	$9.57x10^{-6}$
group 10	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 11	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 12	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 13	0.97	$3.01x10^{-3}$	$9.03x10^{-6}$
group 14	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 15	0.70	$2.75x10^{-3}$	$7.58x10^{-6}$
Volume of solvent	8.92	$1.55x10^{-2}$	$2.39x10^{-4}$
u	0.02		

12.7 mL ± 0.02

Group 13				Standard Uncertainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^{0}C	3	Triangular distribution	$1.74x10^{-3}$	$3.01x10^{-3}$
	The coefficient of volume expansion for aceton $^0C^{-1}$	$1.46x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	0.97			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of *alpha*-HCH in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$79\ ppm \pm ? = \frac{(1028\ ppm \pm 14.3) * (0.97\ mL \pm 0.00301)}{12.7\ mL \pm 0.02}$

	X	u(x)			
Concentration of *alpha*-HCH (ind. soln)	1028	14.3	$1.94x10^{-4}$	1.43x10-2	79 ppm ± 1.13
Amount of *alpha*-HCH	0.97	$3.01x10^{-3}$	$9.53x10^{-6}$		
Solvent	12.7	0.02	$2.48x10^{-6}$		
u	79	1.31			

Table 0.76. The uncertainty of *beta*-Endosulfan in mixture II of mix C

Total volume of materials	3.81
Volume of solvent	8.92

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1.27	$3.34x10^{-3}$	$1.11x10^{-5}$
group 5	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 6	0.79	$2.83x10^{-3}$	$8.00x10^{-6}$
group 7	0.84	$2.88x10^{-3}$	$8.28x10^{-6}$
group 8	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 9	1.06	$3.09x10^{-3}$	$9.57x10^{-6}$
group 10	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 11	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 12	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 13	0.97	$3.01x10^{-3}$	$9.03x10^{-6}$
group 14	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 15	0.70	$2.75x10^{-3}$	$7.58x10^{-6}$
Volume of solvent	8.92	$1.55x10^{-2}$	$2.39x10^{-4}$
u	0.02		

12.7 mL ± 0.02

Group 13				Standard Uncertainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^{0}C	3	Triangular distribution	$1.74x10^{-3}$	$3.01x10^{-3}$
	The coefficient of volume expansion for aceton $^0C^{-1}$	$1.46x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	0.97			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of *beta*-endosulfan in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$$79\ ppm \pm ? = \frac{(1028\ ppm \pm 14.0) * (0.97\ mL \pm 0.00301)}{127.mL \pm 0.02}$$

	X	u(x)			
Concentration of *beta*-endosulfan (ind. soln)	1028	13.59	$1.75x10^{-4}$	$1.37x10^{-2}$	79 ppm ± 1.08
Amount of *beta*-endosulfan	0.97	$3.01x10^{-3}$	$9.53x10^{-6}$		
Solvent	12.7	0.02	$2.48x10^{-6}$		
u	79	1.08			

Table 0.77. The uncertainty of 2,4'-DDT in mixture II of mix C

Total volume of materials	3.81
Volume of solvent	8.92

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1.27	$3.34x10^{-3}$	$1.11x10^{-5}$
group 5	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 6	0.79	$2.83x10^{-3}$	$8.00x10^{-6}$
group 7	0.84	$2.88x10^{-3}$	$8.28x10^{-6}$
group 8	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 9	1.06	$3.09x10^{-3}$	$9.57x10^{-6}$
group 10	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 11	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 12	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 13	0.97	$3.01x10^{-3}$	$9.03x10^{-6}$
group 14	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 15	0.70	$2.75x10^{-3}$	$7.58x10^{-6}$
Volume of solvent	8.92	$1.55x10^{-2}$	$2.39x10^{-4}$
u	0.02		

12.7 mL ± 0.02

Group 15				Standard Un-certainty	Standard Uncer-tainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^{0}C	3	Triangular distribution	$1.26x10^{-3}$	$2.75x10^{-3}$
	The coefficient of volume expansion for aceton $^0C^{-1}$	$1.46x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	0.70			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of 2,4'-DDT in subgroup

C1*W1=C2*W2

C1=(C2∗W2)/W1

$$79\ ppm \pm ? = \frac{(1426\ ppm \pm 14.2) * (0.70\ mL \pm 0.00275)}{12.7\ mL \pm 0.02}$$

	X	u(x)			
Concentration of 2,4'-DDT (ind. soln)	1426	14.20	$9.92x10^{-5}$	$1.08x10^{-2}$	79 ppm ± 0.85
Amount of 2,4'-DDT	0.70	$2.75x10^{-3}$	$1.53x10^{-5}$		
Solvent	12.7	0.02	$2.48x10^{-6}$		
u	79	0.85			

Table 0.78. The uncertainty of Dieldrin subgroup 15 for mixture II of mix C

Total volume of materials	3.81
Volume of solvent	8.92

$\frac{0.006}{\sqrt{6}}$=0.002

Uncertainty for solvent:

	Value(X)	*u(X)*	
group 4	1.27	3.34x10-3	1.11x10-5
group 5	0.90	2.93x10-3	8.61x10-6
group 6	0.79	$2.83x10^{-3}$	$8.00x10^{-6}$
group 7	0.84	$2.88x10^{-3}$	$8.28x10^{-6}$
group 8	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 9	1.06	$3.09x10^{-3}$	$9.57x10^{-6}$
group 10	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 11	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 12	1.15	$3.20x10^{-3}$	$1.02x10^{-5}$
group 13	0.97	$3.01x10^{-3}$	$9.03x10^{-6}$
group 14	0.90	$2.93x10^{-3}$	$8.61x10^{-6}$
group 15	0.70	$2.75x10^{-3}$	$7.58x10^{-6}$
Volume of solvent	8.92	$1.55x10^{-2}$	$2.39x10^{-4}$
u	0.02		

12.7 mL ± 0.02

Group 15				Standard Uncertainty	Standard Uncertainty u(V) of Volume
Volume of the pipette	Temperature change in the lab. ^0C	3	Triangular distribution	$1.26x10^{-3}$	$2.75x10^{-3}$
	The coefficient of volume expansion for aceton $^0C^{-1}$	$1.46x10^{-3}$			
	Volume of the pipette (0.5-5 mL), ml	0.70			
	Cal uncertainty of the pipette, ml	0.002			

For uncertainty of 2,4'-DDT in sub-group

C1*W1=C2*W2

C1=(C2*W2)/W1

$$79\ ppm \pm ? = \frac{(1435\ ppm \pm 18.3) * (0.70\ mL \pm 0.00275)}{12.7\ mL \pm 0.02}$$

	X	u(x)			
Concentration of 2,4'-DDT (ind. soln)	1435	18.30	$1.63x10^{-4}$	$1.34x10^{-2}$	79 ppm ± 1.07
Amount of 2,4'-DDT	0.70	$2.75x10^{-3}$	$1.53x10^{-5}$		
Solvent	12.7	0.02	$2.48x10^{-6}$		
u	79	1.07			

APPENDIX 5 Uncertainty of Calibration Curve of Pesticides for mix A , mix B and mix C

Table 0.79. Names of method for HCB in mixture I of mix A

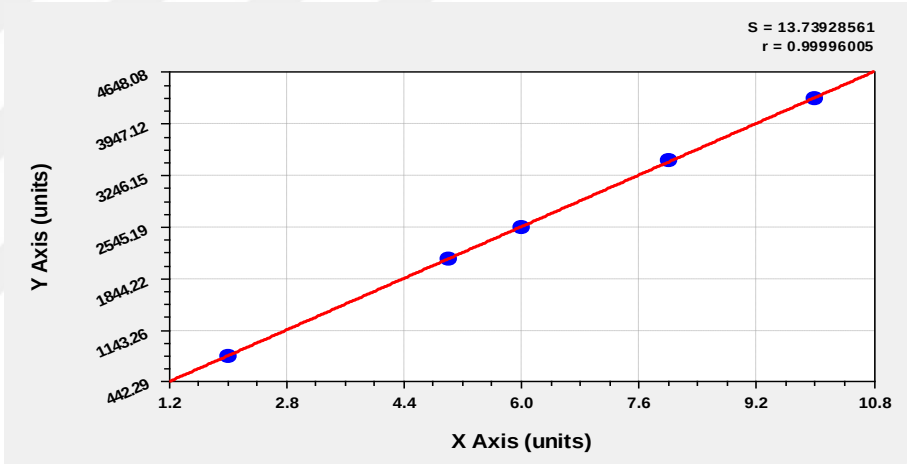
HCB in mixture I	
Date	**Method**
8.05.2023	pestisitcalibration
10.06.2023	pestisitcal
18.06.2023	pestisitcal
25.06.2023	pestisitcal
3.07.2023	pestisitcal
20.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.80. Calculation of uncertainty of calibration curve for HCB in mixture I of mix A on June and July 2023

10.06.2023 / 18.06.2023 / 25.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	C_i	$C_i - C_{ort}$	$(C_i - C_{av})^2$	S_{xx}	6
2	792.774	1.81	-4.39	19.3	**C0 (ppm)**	8
5	2122.681	4.84	-1.36	1.9	**Cort**	6.0
6	2543.646	5.80	-0.40	0.2	**S**	13.7
8	3447.014	7.85	1.65	2.7	**B1**	438.9
10	4,297.602	9.79	3.59	12.9	**p**	1
$\bar{C}$=6.2			S_{xx}	6.016	**n**	5
					u(C_0)	0.029

Table 0.81. Calculation of uncertainty of calibration curve for HCB in mixture I of mix A on 20 August and 02 October 2023

20.08.2023 / 02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	12.7
2	331.702	2.20	-2.80	7.82	**C_0 (ppm)**	3
3	484.105	3.22	-1.78	3.18	**C_{ort}**	5.0
10	1536.388	10.21	5.21	27.1	**S**	1.362
$\bar{C}$=5			**S_{xx}**	12.7	**B_1**	1.50×10^2
					p	1
					n	3
					$u(C_0)$	0.007



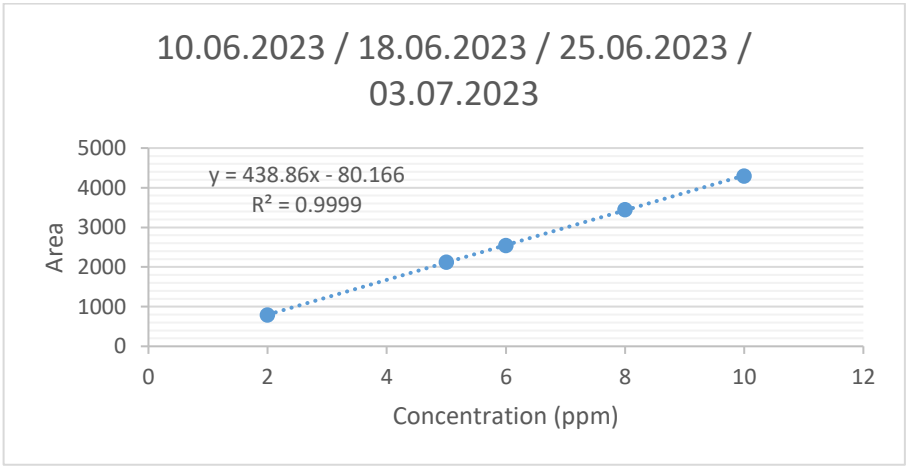


Figure 0.1. Calibration curves of HCB in mixture I of mix A on June and July 2023

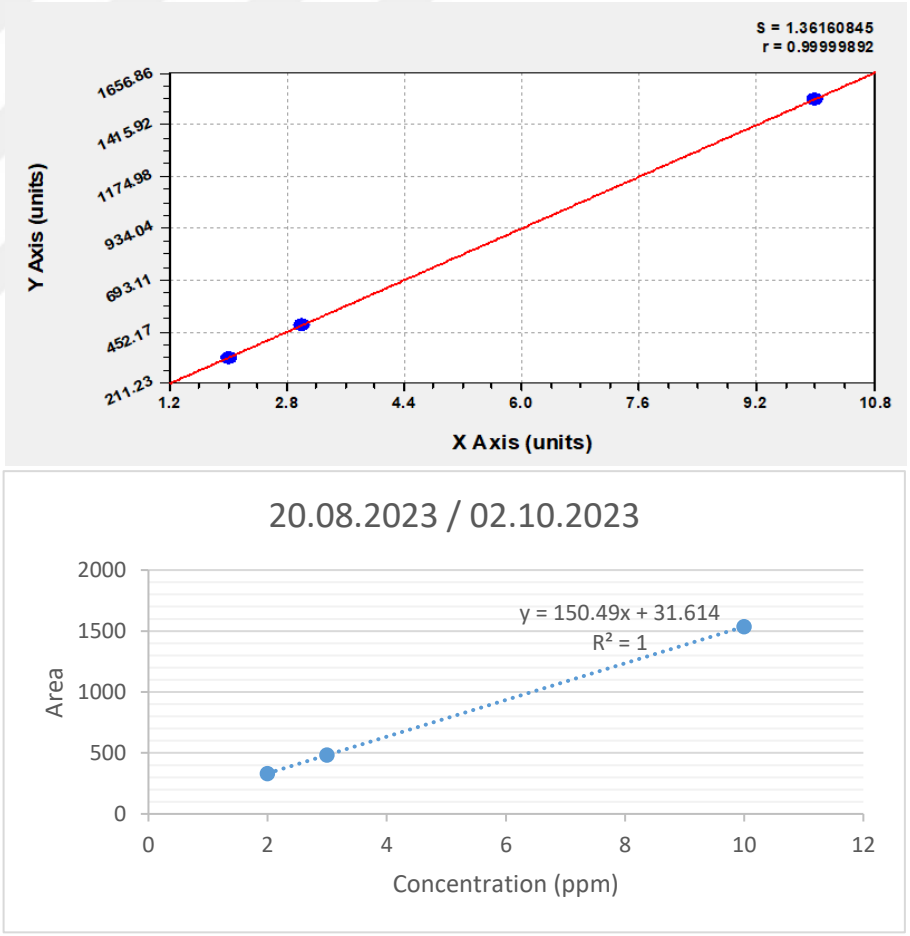


Figure 0.2. Calibration curves of HCB in mixture I of mix A on August and October 2023

Table 0.82. Names of method for metolachlor in mixture I of mix A

metolachlor in mixture I	
Date	**Method**
8.05.2023	pestisitcalibration
10.06.2023	pestisitcal
18.06.2023	pestisitcal
25.06.2023	pestisitcal
3.07.2023	pestisitcal
21.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.83. Calculation of uncertainty of calibration curve for Metolachlor in mixture I of mix A on 8 May 2023

8.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	8.78
3	907.687	1.49	-4.51	20.31	**C_0 (ppm)**	6
5	2,132.866	3.51	-2.49	6.21	**C_{ort}**	6.0
6	2715.633	4.47	-1.53	2.35	**S**	13.0
10	5,165.594	8.50	2.50	6.23	**B_1**	$6.08x10^2$
$\bar{C}$=6			**S_{xx}**	8.78	**p**	1
					n	4
					$u(C_0)$	0.011

Table 0.84. Calculation of uncertainty of calibration curve for Metolachlor in mixture I of mix A on June and July 2023

10.06.2023 / 18.06.2023 / 25.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	7.02
2	1118.791	1.43	-4.77	22.7	**C_0 (ppm)**	6
5	3469.473	4.44	-1.76	3.10	**C_{ort}**	6.2
6	4174.612	5.34	-0.86	0.74	**S**	37.16
8	5804.951	7.43	1.23	1.50	**B_1**	$7.82x10^2$
10	7,373.132	9.43	3.23	10.4	**p**	1
$\bar{C}$=6.2			**S_{xx}**	7.02	**n**	5
					$u(C_0)$	0.022

Table 0.85. Calculation of uncertainty of calibration curve for Metolachlor in mixture I of mix A on August 2023

21.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	8.29
2	285.152	1.41	-3.59	12.86	**C_0 (ppm)**	4
3	496.435	2.46	-2.54	6.44	**C_{ort}**	5.0
4	712.779	3.53	-1.47	2.15	**S**	10.28
6	1102.154	5.47	0.47	0.22	**B_1**	$2.02x10^2$
10	1,904.959	9.45	4.45	19.77	**p**	1
$\bar{C}$=5			**S_{xx}**	8.29	**n**	5
					$u(C_0)$	**0.029**

Table 0.86. Calculation of uncertainty of calibration curve for Metolachlor in mixture I of mix A on 2 October 2023

02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10.4
2	44.481	-5.30	28.09	0.95	**C_0 (ppm)**	8
5	180.87	-2.39	5.70	3.86	**C_{ort}**	6.2
8	325.468	0.70	0.49	6.95	**S**	2.37
10	417.687	2.67	7.13	8.92	**B_1**	$4.68x10^1$
$\bar{C}$=6.3			**S_{xx}**	10.4	**p**	1
					n	4
					$u(C_0)$	0.038

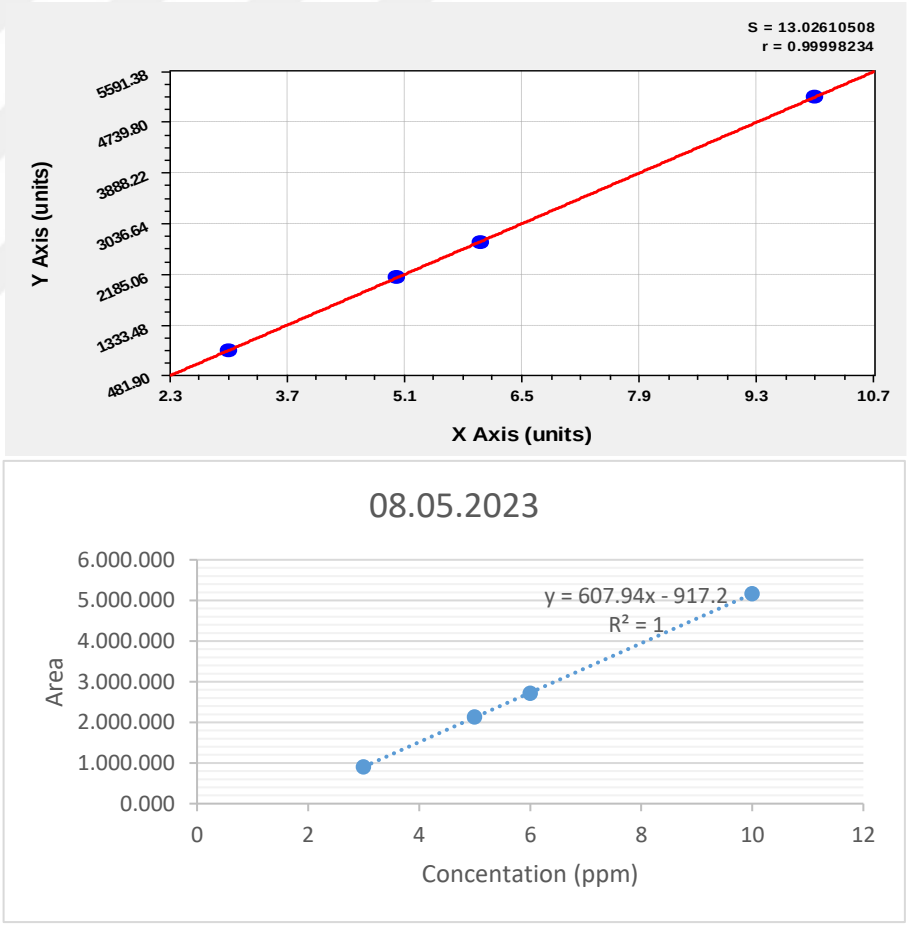


Figure 0.3. Calibration curves of Metolachlor in mixture I of mix A on May 2023

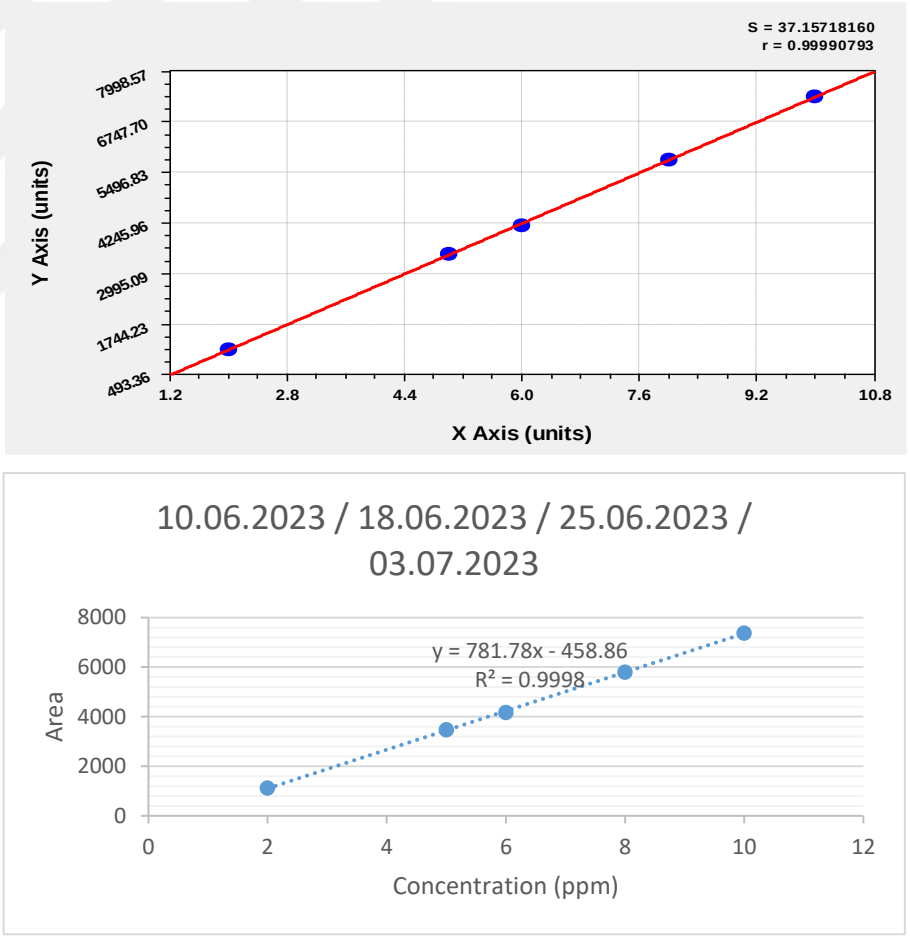
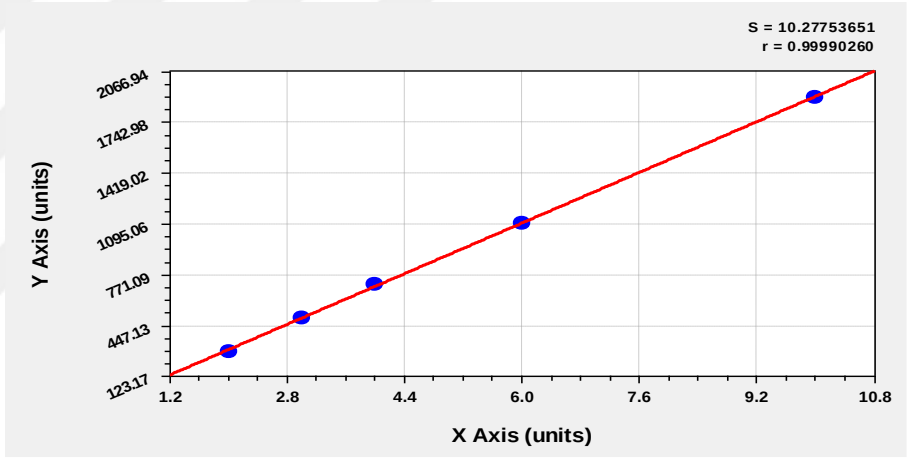


Figure 0.4. Calibration curves of Metolachlor in mixture I of mix A on June and July 2023



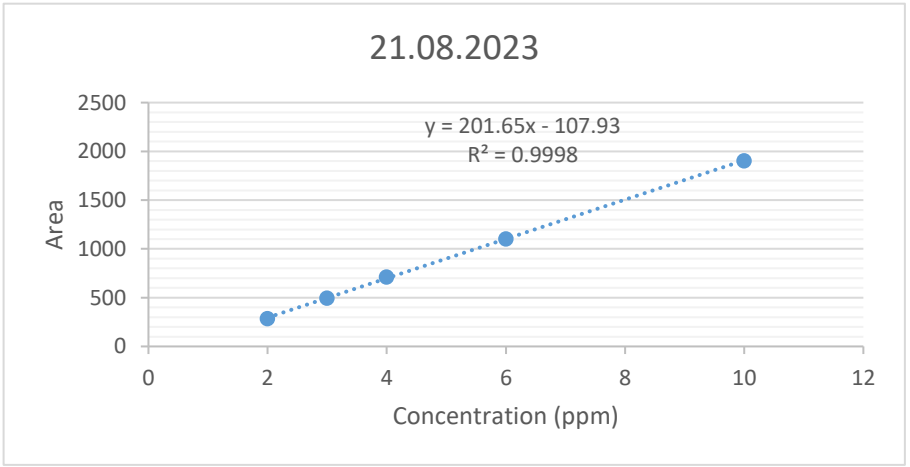
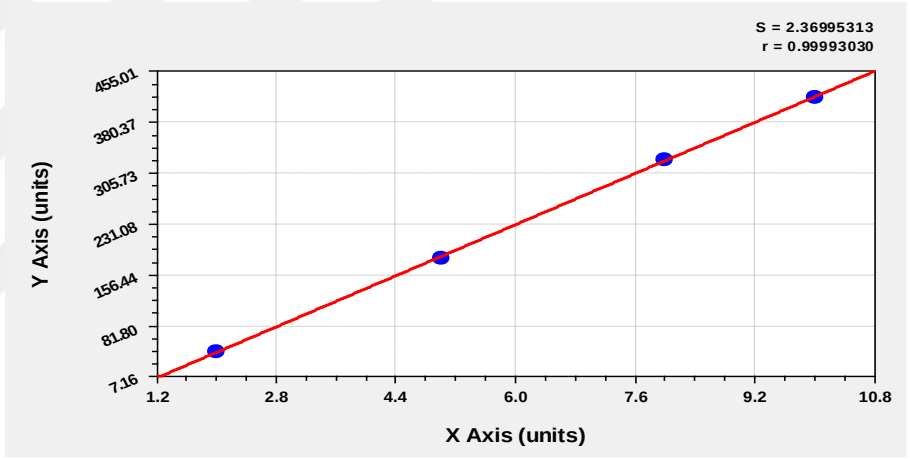


Figure 0.5. Calibration curves of Metolachlor in mixture I of mix A on August 2023



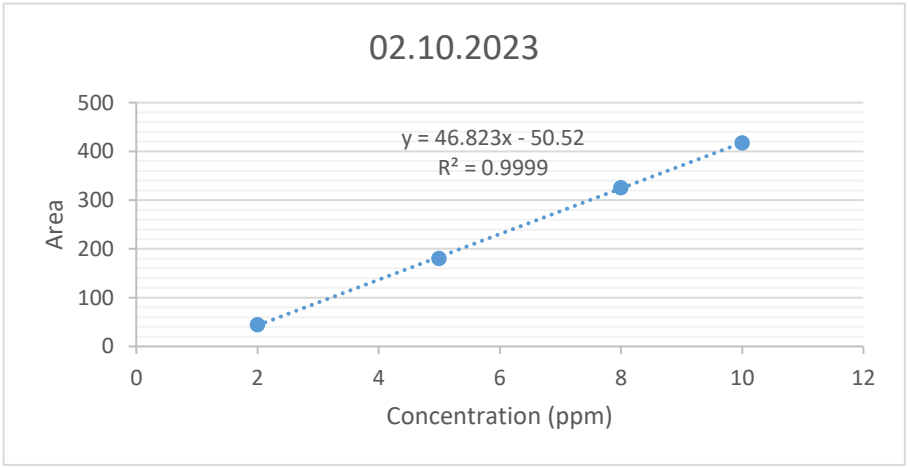


Figure 0.6. Calibration curves of Metolachlor in mixture I of mix A on October 2023

Table 0.87. Names of method for *alpha*-HCH in mixture II of mix A

***alpha*-HCH in mixture II**	
Date	**Method**
8.05.2023	pestisitcalibration
10.06.2023	pestisitcal
18.06.2023	pestisitcal
25.06.2023	pestisitcal
3.07.2023	calmix102
20.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.88. Calculation of uncertainty of calibration curve for *alpha*-HCH in mixture II of mix A on May 2023

9.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	11.4
2	347.311	1.53	-4.22	17.8	**C0 (ppm)**	8
3	588.997	2.60	-3.15	9.93	**Cort**	5.8
8	1,711.346	7.55	1.80	3.24	**S**	8
10	2,168.546	9.57	3.82	14.56	**B1**	$2.27x10^2$
$\bar{C}$=5.8			**S_{xx}**	11.4	**p**	1
					n	4
					$u(C_0)$	**0.029**

Table 0.89. Calculation of uncertainty of calibration curve for *alpha*-HCH in mixture II of mix A on June and July 2023

10.06.2023 / 18.06.2023 / 25.06.2023 / 26.06.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10.7
2	447.248	1.85	-4.15	17.22	**C_0 (ppm)**	6
3	1405.675	5.81	-0.19	0.03	**C_{ort}**	6.0
10	2,381.357	9.85	3.85	14.82	**S**	7.0
$\bar{C}$=6			**S_{xx}**	10.7	**B_1**	$2.42x10^2$
					p	1
					n	3
					$u(C_0)$	**0.017**

Table 0.90. Calculation of uncertainty of calibration curve for *alpha*-HCH in mixture II of mix A on July 2023

3.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	44.4
2	236.754	1.64	-5.03	25.28	**C_0 (ppm)**	8
8	1103.111	7.64	0.97	0.94	**C_{ort}**	6.7
10	1,392.270	9.64	2.97	8.84	**S**	0.22
$\bar{C}$=6.7			**S_{xx}**	44.4	**B_1**	$1.44x10^2$
					p	1
					n	3
					$u(C_0)$	**0.001**

Table 0.91. Calculation of uncertainty of calibration curve for *alpha*-HCH in mixture II of mix A on August 2023

21.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	6.5
2	150.424	1.82	-4.18	17.51	**C_0 (ppm)**	6
4	314.746	3.80	-2.20	4.84	**C_{ort}**	6,0
6	478.368	5.77	-0.23	0.05	**S**	2.77
8	650.318	7.85	1.85	3.42	**B_1**	$8.28x10^1$
10	811.008	9.79	3.79	14.37	**p**	1
$\bar{C}$=6.0			**S_{xx}**	6.5	**n**	5
					$u(C_0)$	0.015

Table 0.92. Calculation of uncertainty of calibration curve for *alpha*-HCH in mixture II of mix A on October 2023

2.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	5.6
2	136.068	2.00	-4.20	17.63	**C_0 (ppm)**	6
5	337.202	4.96	-1.24	1.54	**C_{ort}**	6.2
6	399.308	5.87	-0.33	0.11	**S**	4.21
8	544.2	8.01	1.81	3.26	**B_1**	67.98
10	678.447	9.98	3.78	14.29	**p**	1
$\bar{C}$=6.2			**S_{xx}**	5.6	**n**	5
					$u(C_0)$	0.028

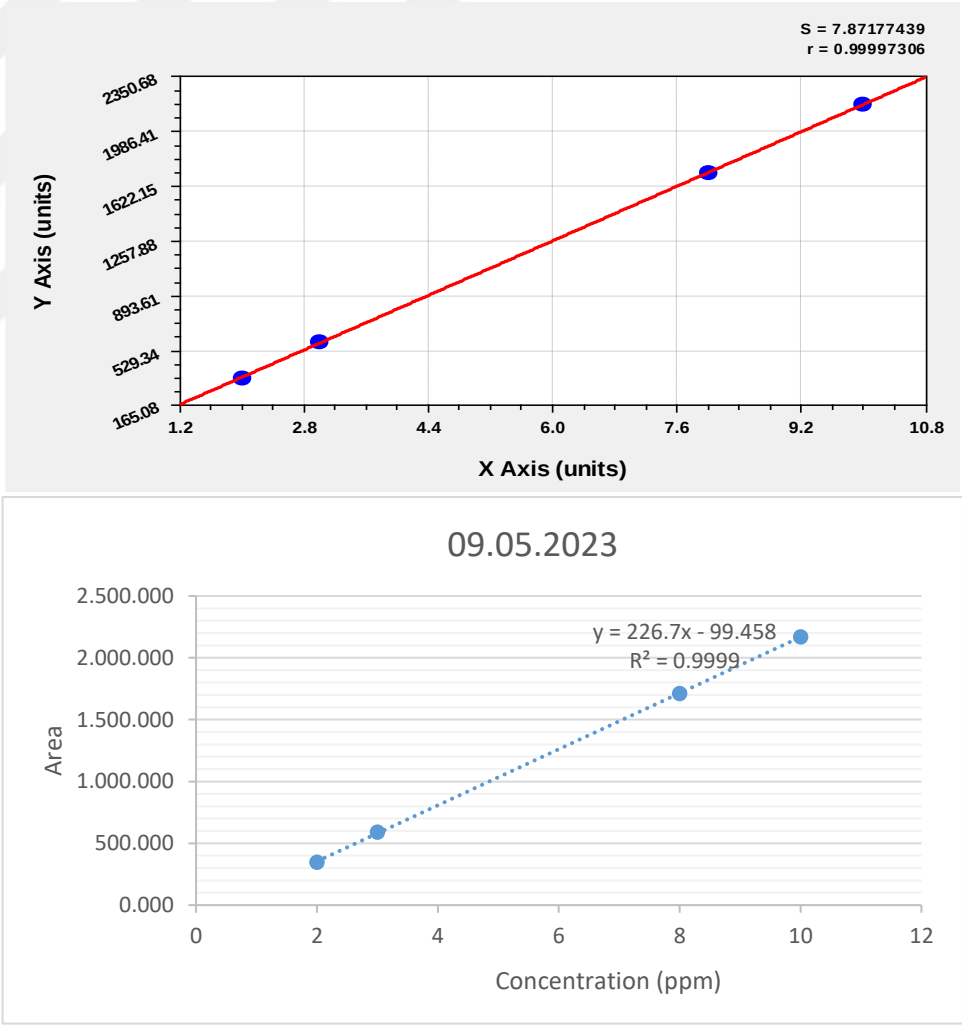


Figure 0.7. Calibration curves of *alpha*-HCH in mixture II of mix A on May 2023

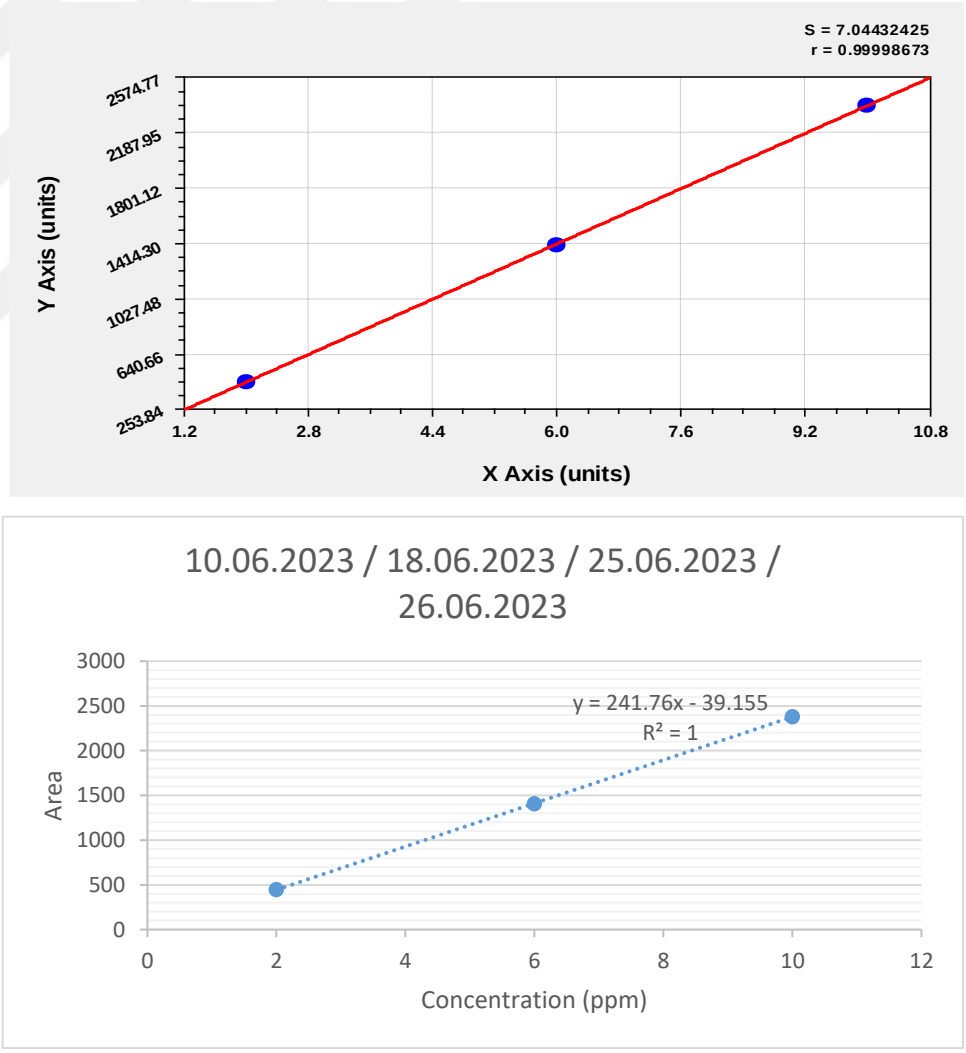
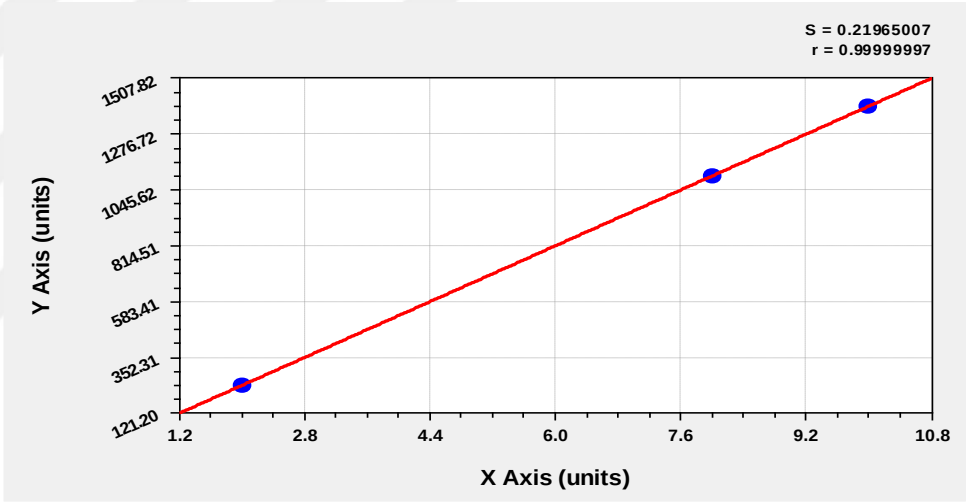


Figure 0.8. Calibration curves of *alpha*-HCH in mixture II of mix A on June and July 2023



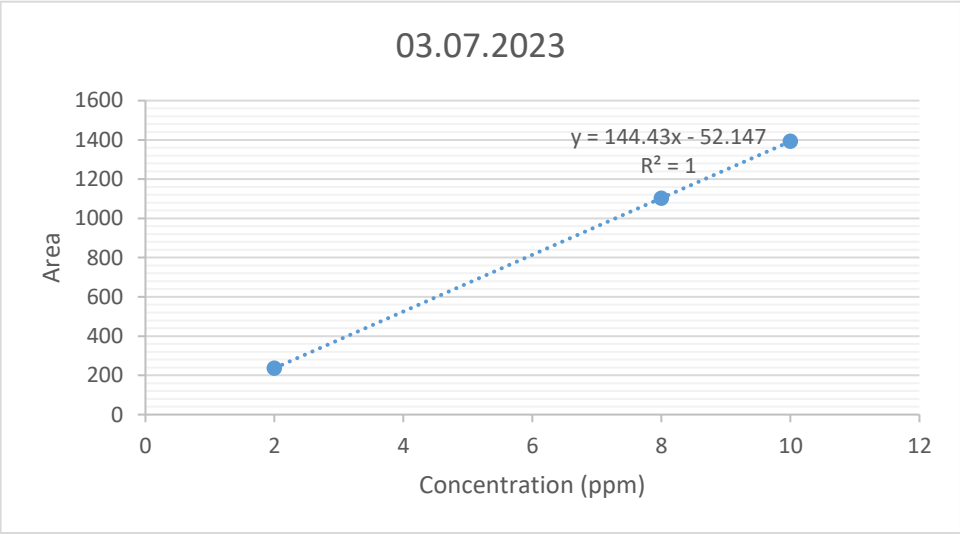
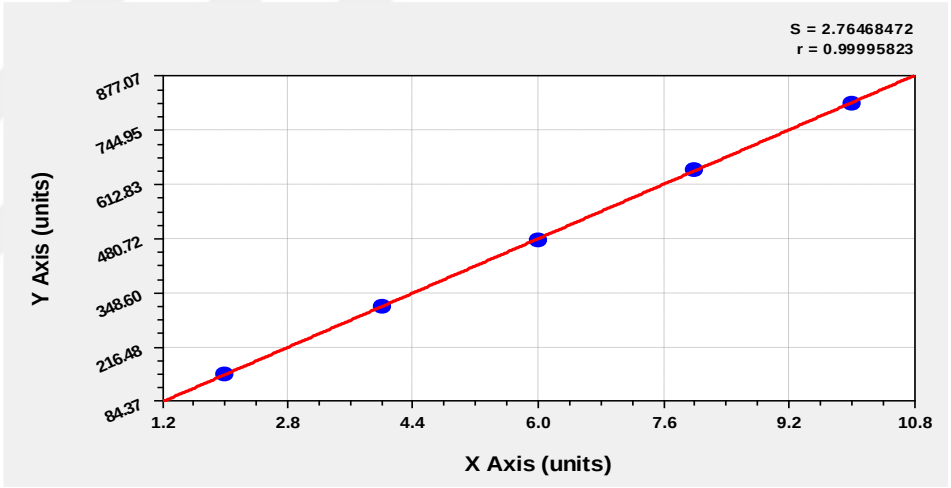


Figure 0.9. Calibration curves of *alpha*-HCH in mixture II of mix A on July 2023



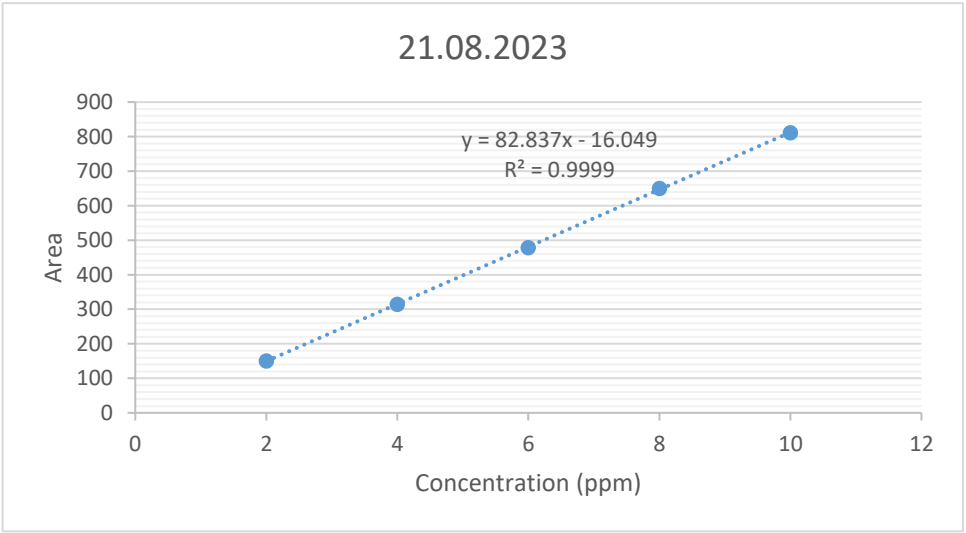


Figure 0.10. Calibration curves of *alpha*-HCH in mixture II of mix A on August 2023

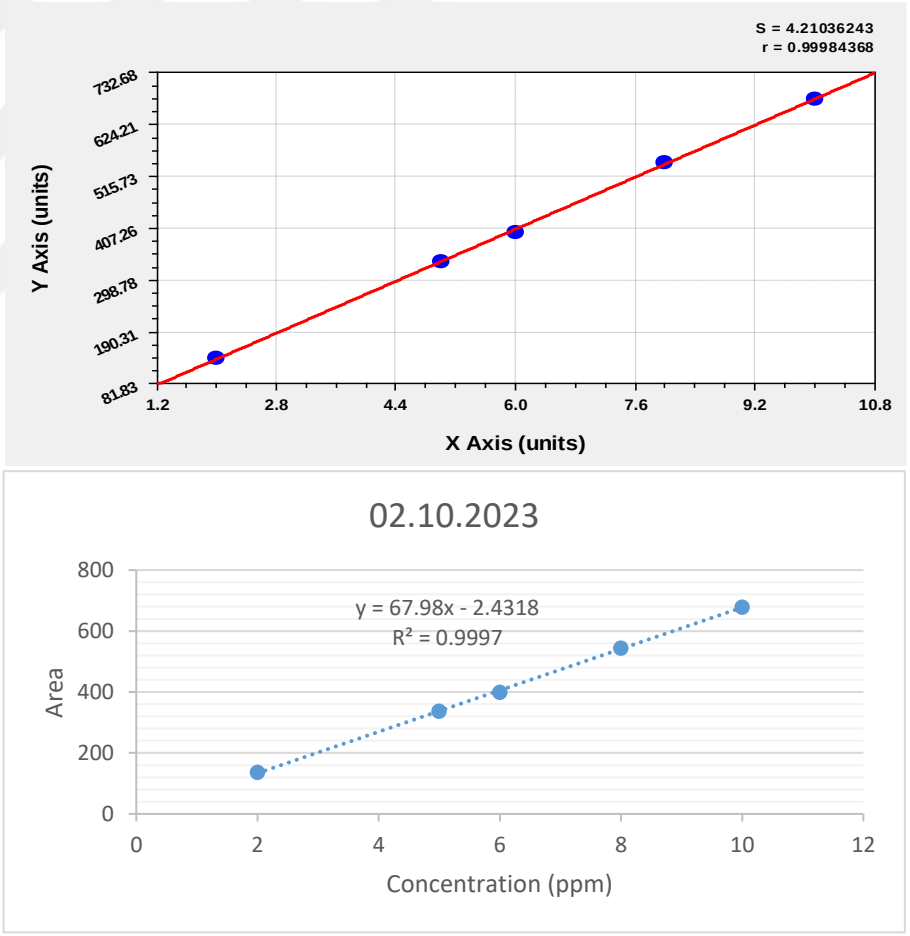


Figure 0.11. Calibration curves of *alpha*-HCH in mixture II of mix A on October 2023

Table 0.93. Names of method for *gamma*-HCH in mixture II of mix A

***gamma*-HCH in mixture II**	
Date	**Method**
9.05.2023	pestisitcalibration
10.06.2023	pestisitcal
11.06.2023	pestisitcal
18.06.2023	pestisitcal
25.06.2023	pestisitcal
3.07.2023	pestisitcal
28.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.94. Calculation of uncertainty of calibration curve for *gamma*-HCH in mixture II of mix A on May, June and July 2023

09.05.2023 / 11.06.2023 / 18.06.2023 /25.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	C_i	$C_i - C_{ort}$	$(C_i - C_{av})^2$	S_{xx}	7.5
2	288.924	1.86	-4.34	18.86	C_0 (ppm)	6
5	759.160	4.88	-1.32	1.74	C_{ort}	6.2
6	911.577	5.86	-0.34	0.12	**S**	7.53
8	1,228.312	8.00	-1.8	3.24	B_1	$1.56x10^2$
10	1,532.013	9.85	3.65	13.30	**p**	1
$\bar{C}$=6.2			S_{xx}	7.5	**n**	5
					$u(C_0)$	0.022

Table 0.95. Calculation of uncertainty of calibration curve for *gamma*-HCH in mixture II of mix A on June 2023

10.06.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	8.4
2	369.77	1.69	-4.56	20.82	**C_0 (ppm)**	8
5	1036.158	4.73	-1.52	2.32	**C_{ort}**	6.3
8	1681.074	7.67	1.42	2.02	**S**	25.7
10	2,127.840	9.71	3.46	11.96	**B_1**	$2.19x10^2$
$\bar{C}$=6.3			**S_{xx}**	8.4	**p**	1
					n	4
					$u(C_0)$	0.092

Table 0.96. Calculation of uncertainty of calibration curve for *gamma*-HCH in mixture II of mix A on August 2023

28.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	6.2
2	138.677	1.89	-4.11	16.90	**C_0 (ppm)**	6
4	285.45	3.89	-2.11	4.46	**C_{ort}**	5.0
6	434.771	5.92	-0.08	0.01	**S**	1.211
8	579.222	7.89	1.89	3.58	**B_1**	$7.34x10^1$
10	725.737	9.89	3.89	1512	**p**	1
$\bar{C}$=6			**S_{xx}**	6.2	**n**	5
					$u(C_0)$	0.010

Table 0.97. Calculation of uncertainty of calibration curve for *gamma*-HCH in mixture II of mix A on 2 October 2023

02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	9.2
2	120.578	1.93	-4.32	18.65	**C_0 (ppm)**	4
5	304.617	4.88	-1.37	1.88	**C_{ort}**	8.0
8	494.709	7.93	1.68	2.81	**S**	1.77
10	619.046	9.92	3.67	13.45	**B_1**	62.42
$\bar{C}$=8.0			**S_{xx}**	9.2	**p**	1
					n	4
					$u(C_0)$	0.040

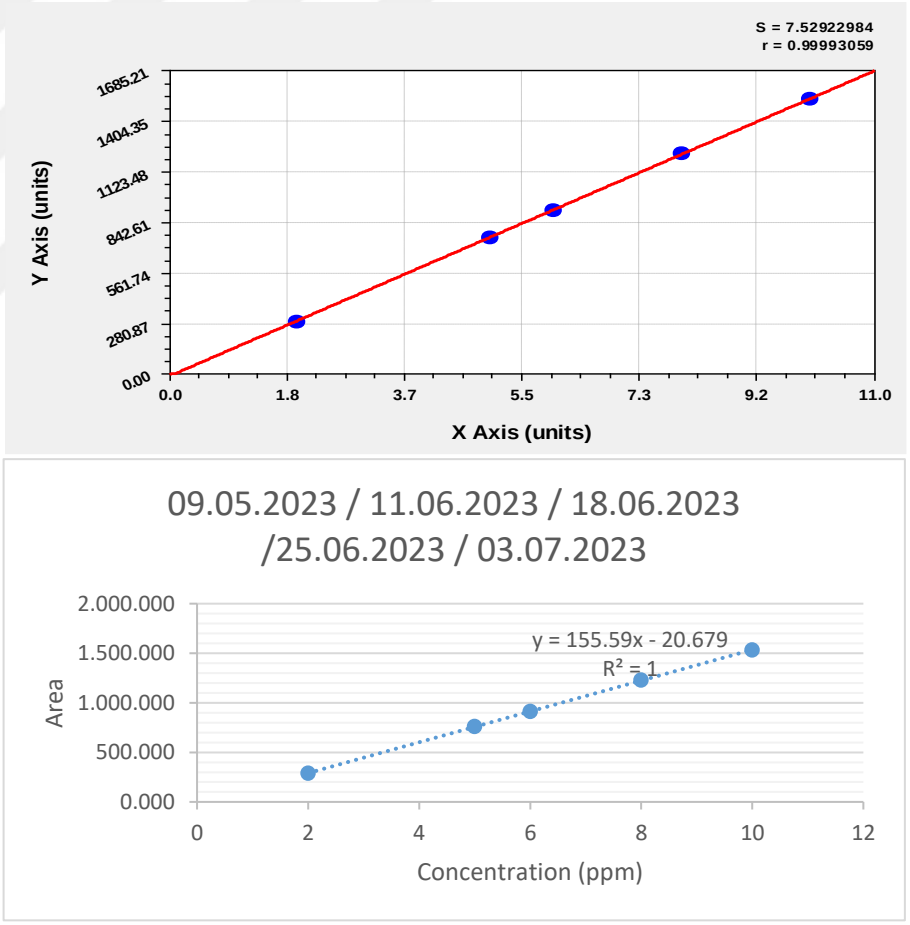


Figure 0.12. Calibration curves of *gamma*-HCH in mixture II of mix A on May, June and July 2023

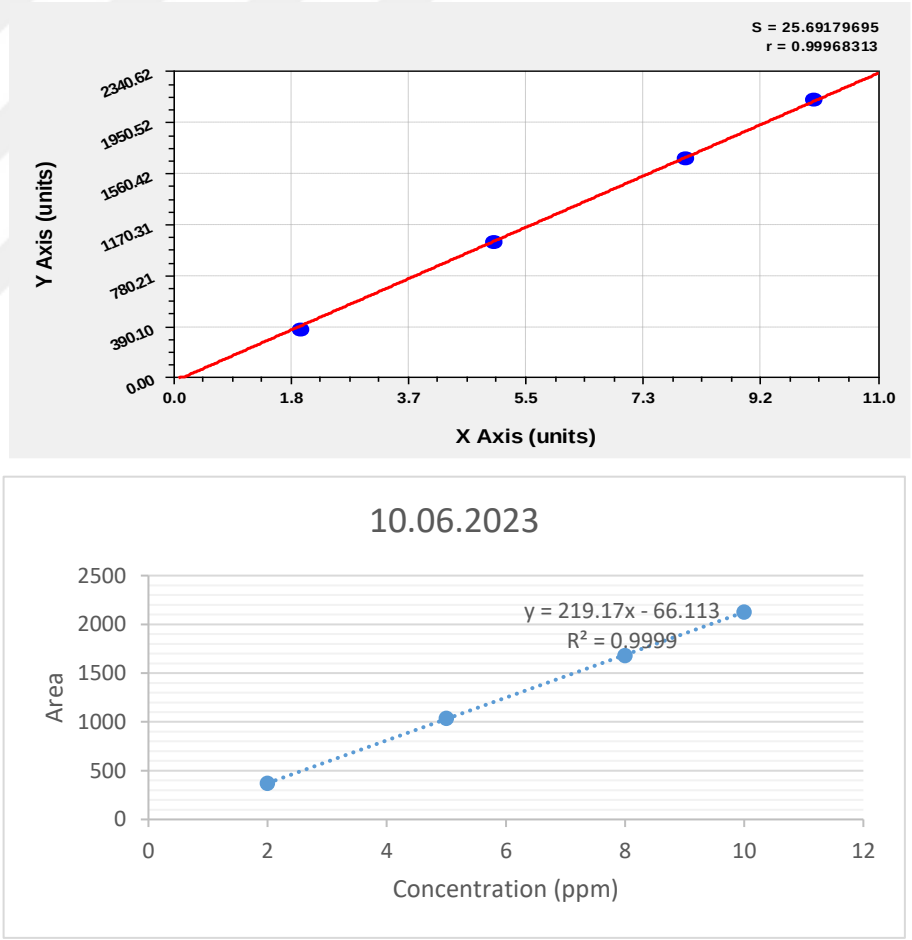


Figure 0.13. Calibration curves of *gamma*-HCH in mixture II of mix A on June 2023

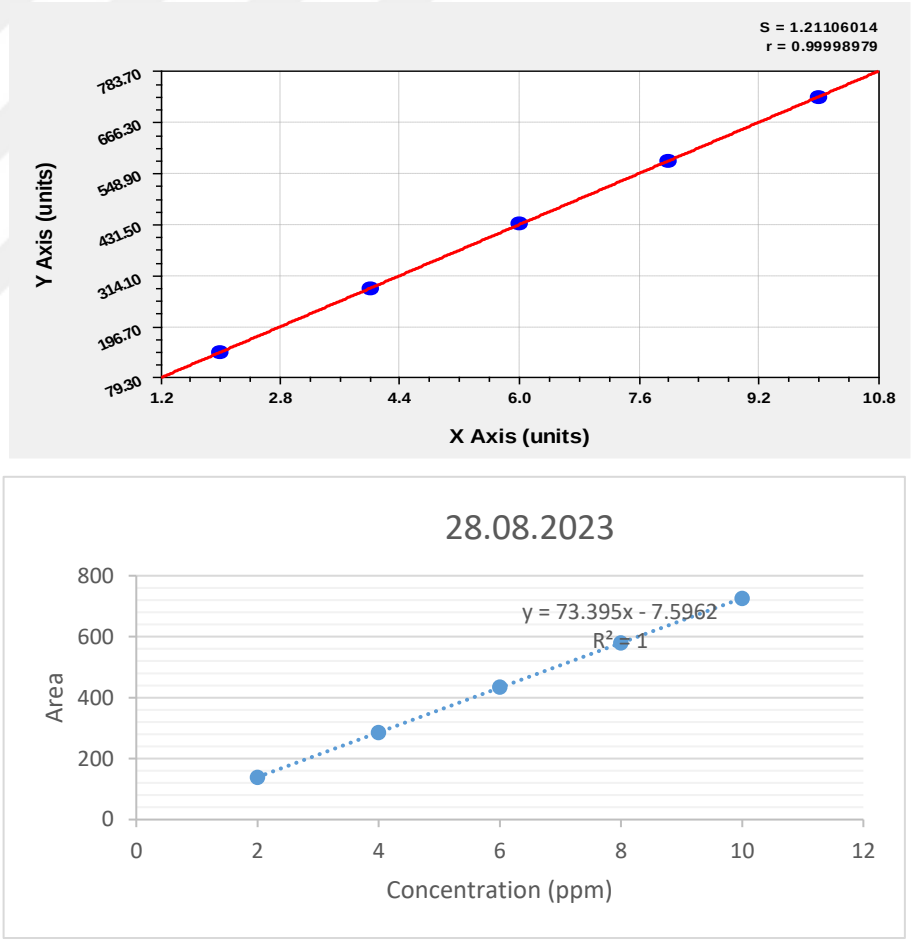


Figure 0.14. Calibration curves of *gamma*-HCH in mixture II of mix A on August 2023

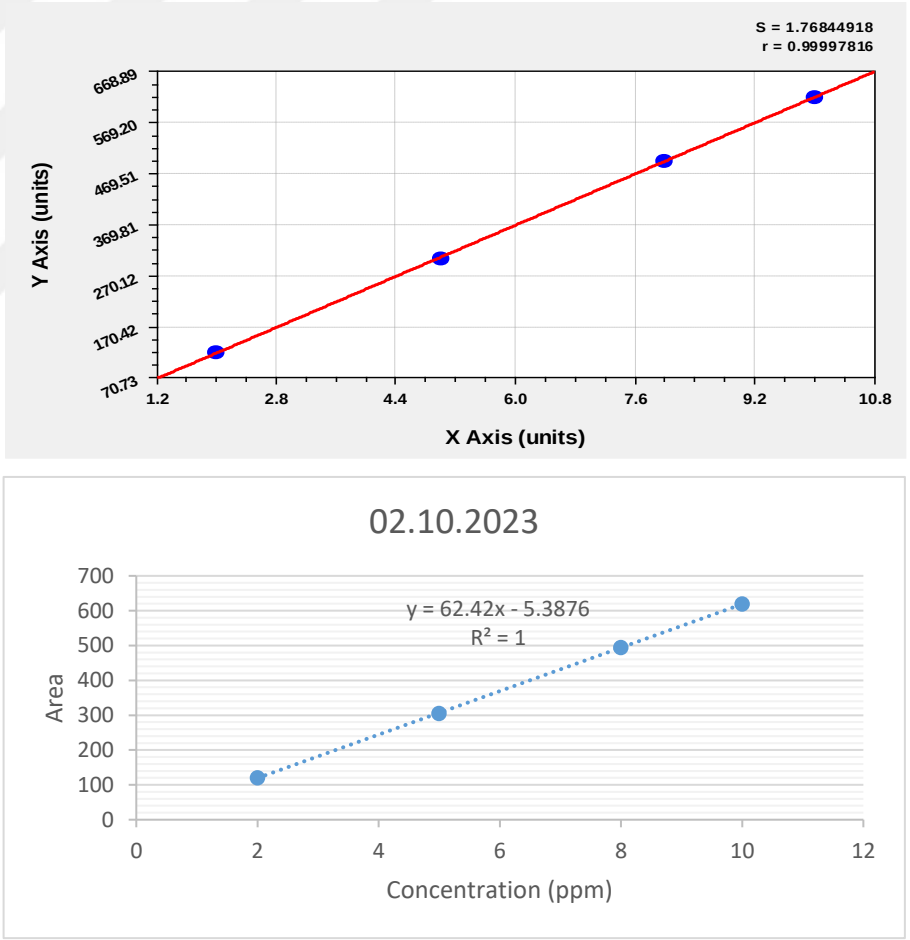


Figure 0.15. Calibration curves of *gamma*-HCH in mixture II of mix A on October 2023

Table 0.98. Names of method for aldrin in mixture II of mix A

aldrin in mixture II	
Date	**Method**
8.05.2023	pestisitcalibration
10.06.2023	pestisitcal
18.06.2023	pestisitcal
25.06.2023	pestisitcal
3.07.2023	pestisitcal
21.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.99. Calculation of uncertainty of calibration curve for Aldrin in mixture II of mix A on May 2023

8.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	11.3
2	431.086	1.57	-4.18	17.48	**C_0 (ppm)**	8
3	707.917	2.58	-3.17	10.07	**C_{ort}**	5.8
8	2,087.936	7.60	1.85	3.41	**S**	5.61
10	2,626.741	9.56	3.81	14.50	**B_1**	$2.75x10^2$
$\bar{C}$=5.8			**S_{xx}**	11.3	**p**	1
					n	4
					$u(C_0)$	0.017

Table 0.100. Calculation of uncertainty of calibration curve for Aldrin in mixture II of mix A on June and July 2023

10.06.2023 / 18.06.2023 / 25.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	8.8
2	183.054	1.71	-4.79	22.90	**C_0 (ppm)**	8
6	611.956	5.73	-0.77	0.59	**C_{ort}**	6.5
8	824.657	7.73	1.23	1.50	**S**	1.25
10	1,036.744	9.71	3.21	10.32	**B_1**	1.07x102
$\bar{C}$=6.5			**S_{xx}**	8.8	**p**	1
					n	4
					$u(C_0)$	0.008

Table 0.101. Calculation of uncertainty of calibration curve for Aldrin in mixture II of mix A on August 2023

21.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	4.7
3	320.09	2.96	-2.04	4.17	**C_0 (ppm)**	4
4	427.763	3.95	-1.05	1.09	**C_{ort}**	5.0
8	860.849	7.96	2.96	8.74	**S**	0.37
$\bar{C}$=5			**S_{xx}**	4.7	**B_1**	108.19
					p	1
					n	3
					$u(C_0)$	0.003

Table 0.102. Calculation of uncertainty of calibration curve for Aldrin in mixture II of mix A on October 2023

02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	5.0
4	210.179	4.19	-2.81	7.88	**C_0 (ppm)**	4
6	311.985	6.22	-0.78	0.60	**C_{ort}**	5.0
8	410.025	8.18	1.18	1.39	**S**	0.63
10	511.626	10.21	3.21	10.29	**B_1**	50.12
$\bar{C}$=5.0			**S_{xx}**	5.0	**p**	1
					n	7
					$u(C_0)$	0.007

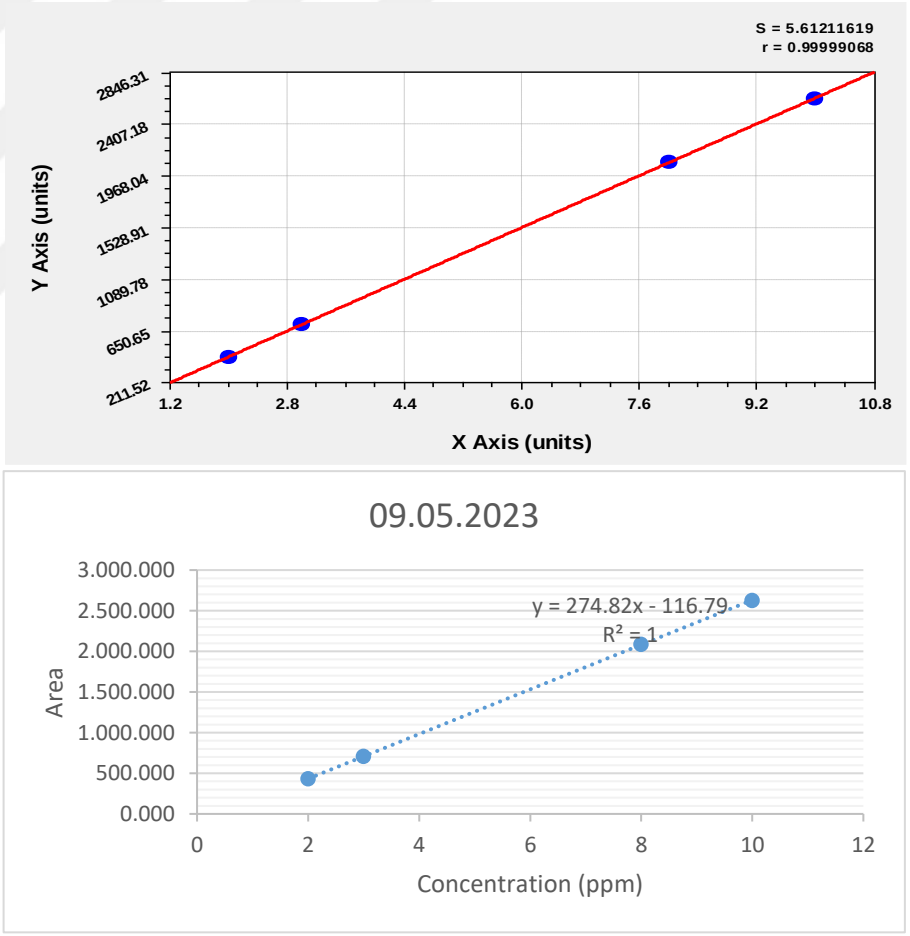


Figure 0.16. Calibration curves of Aldrin in mixture II of mix A on May 2023

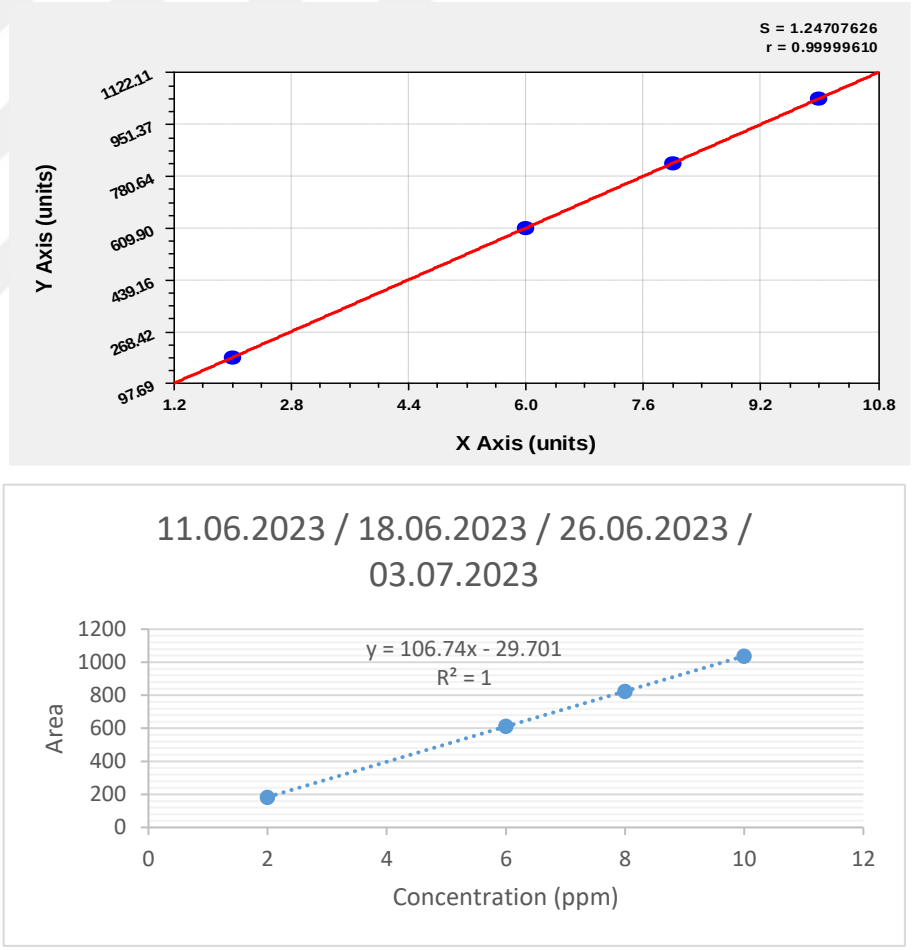
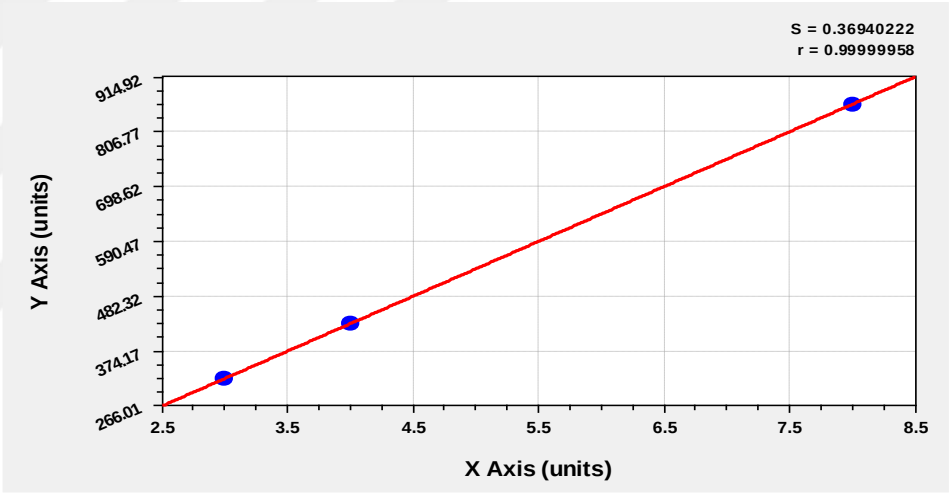


Figure 0.17. Calibration curves of Aldrin in mixture II of mix A on June and July 2023



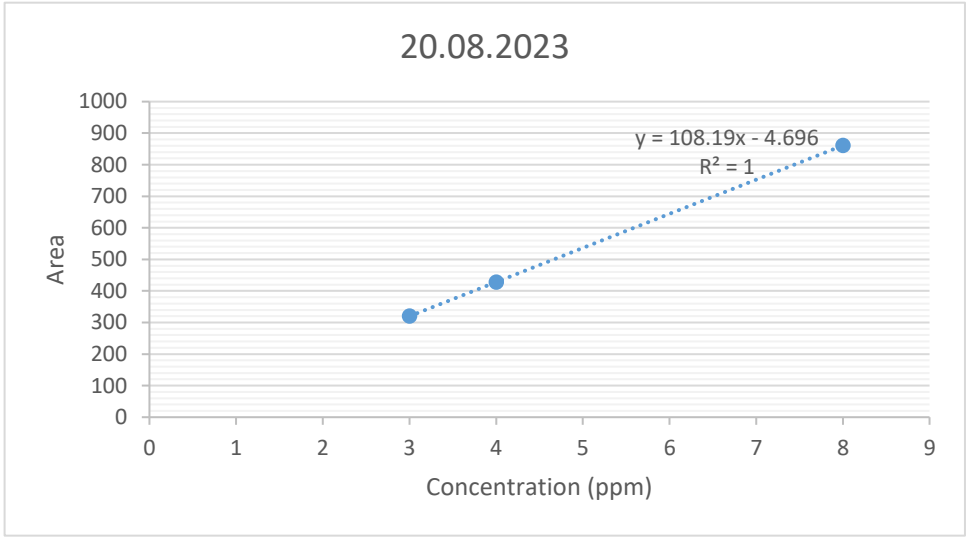


Figure 0.18. Calibration curves of Aldrin in mixture II of mix A on August 2023

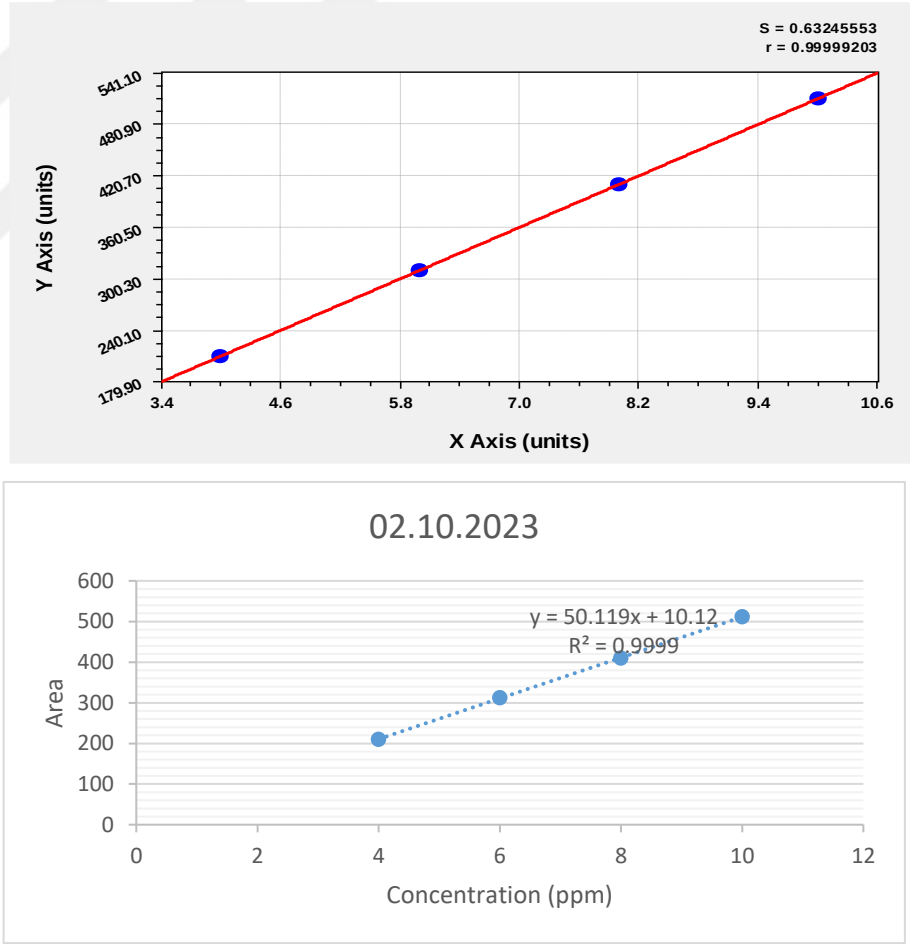


Figure 0.19. Calibration curves of Aldrin in mixture II of mix A on October 2023

Table 0.103. Names of method for Dieldrin in mixture II of mix A

dieldrin in mixture II	
Date	**Method**
8.05.2023	pestisitcalibration
10.06.2023	pestisitcal
18.06.2023	pestisitcal
25.06.2023	pestisitcal
3.07.2023	pestisitcal
20.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.104. Calculation of uncertainty of calibration curve for Dieldrin in mixture II of mix A on May 2023

8.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	12
2	394.968	1.21	-4.54	20.58	**C_0 (ppm)**	10
3	734.218	2.26	-3.49	12.21	**C_{ort}**	5.8
8	2,359.722	7.25	1.50	2.25	**S**	8.498
10	3,000.697	9.22	3.47	12.05	**B_1**	$3.25x10^2$
$\bar{C}$=5.8			**S_{xx}**	12	**p**	1
					n	4
					$u(C_0)$	0.035

Table 0.105. Calculation of uncertainty of calibration curve for Dieldrin in mixture II of mix A on June and July 2023

10.06.2023 / 18.06.2023 / 25.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	3.7
5	240.136	4.47	-2.78	7.72	**C_0 (ppm)**	6
6	289.548	5.39	-1.86	3.46	**C_{ort}**	7.3
8	400.161	7.45	0.20	0.04	**S**	2.23
10	507.024	9.44	2.19	4.80	**B_1**	$5.37x10^1$
$\bar{C}$=7.3			**S_{xx}**	3.7	**p**	1
					n	4
					$u(C_0)$	0.034

Table 0.106. Calculation of uncertainty of calibration curve for Dieldrin in mixture II of mix A on August 2023

21.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	5.4
2	221.032	1.54	-2.71	7.33	**C_0 (ppm)**	4
3	365.058	2.55	-1.70	2.89	**C_{ort}**	4.3
4	511.506	3.57	-0.68	0.46	**S**	2.22
8	1080.95	7.55	3.30	10.87	**B_1**	$1.43x10^2$
$\bar{C}$=4.3			**S_{xx}**	5.4	**p**	1
					n	4
					$u(C_0)$	0.008

Table 0.107. Calculation of uncertainty of calibration curve for Dieldrin in mixture II of mix A on October 2023

02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	9.34
2	281.047	1.65	-4.60	21.20	**C_0 (ppm)**	5
5	782.51	4.58	-1.67	2.78	**C_{ort}**	6.3
8	1290.986	7.56	1.31	1.71	**S**	26.53
10	1650.578	9.66	3.41	11.66	**B_1**	$1.71x10^2$
$\bar{C}$=6.3			**S_{xx}**	9.34	**p**	1
					n	4
					$u(C_0)$	0.100

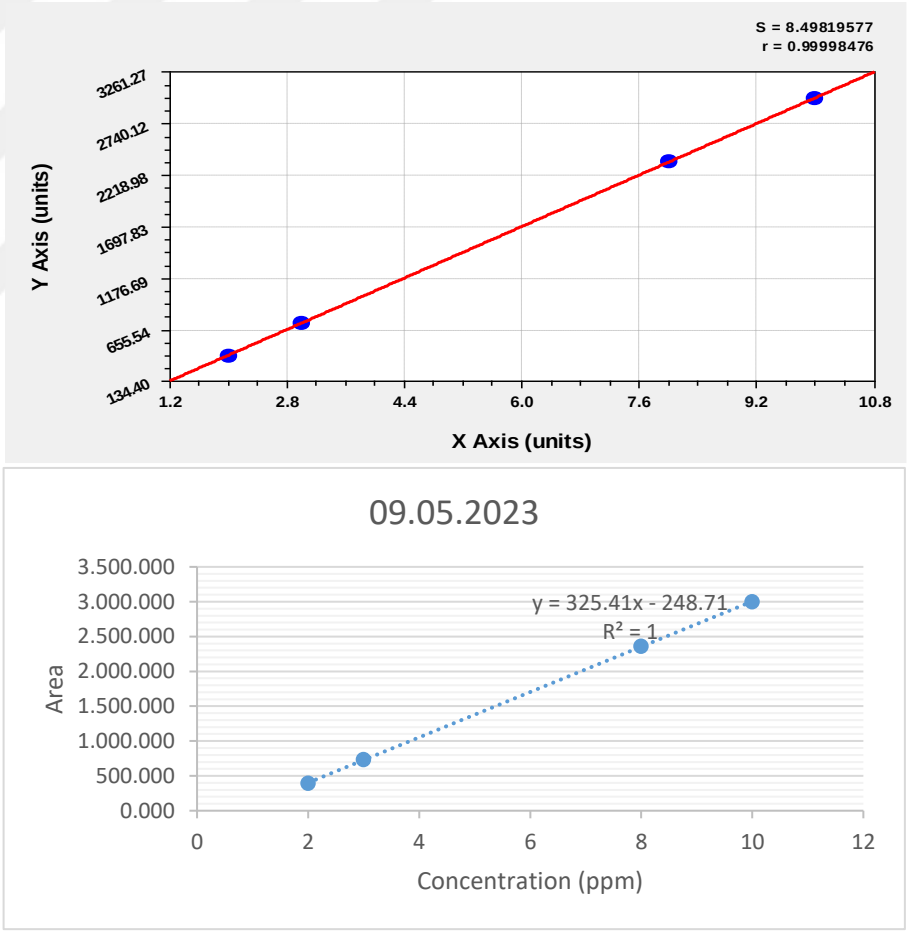


Figure 0.20. Calibration curves of Dieldrin in mixture II of mix A on May 2023

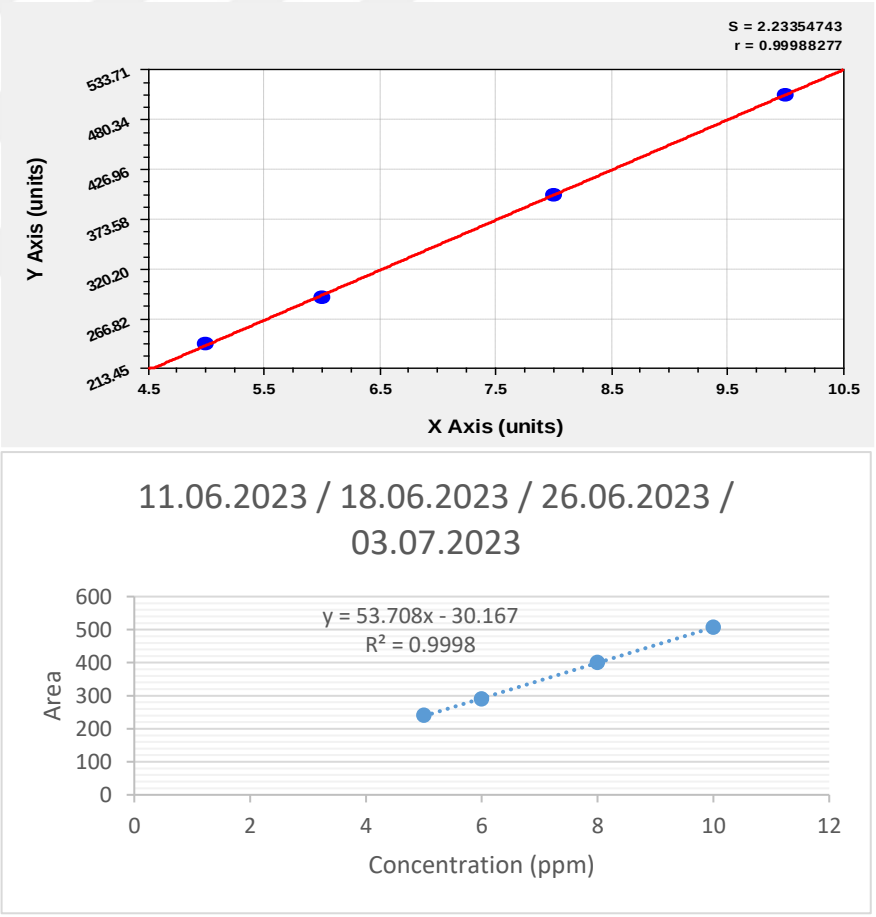
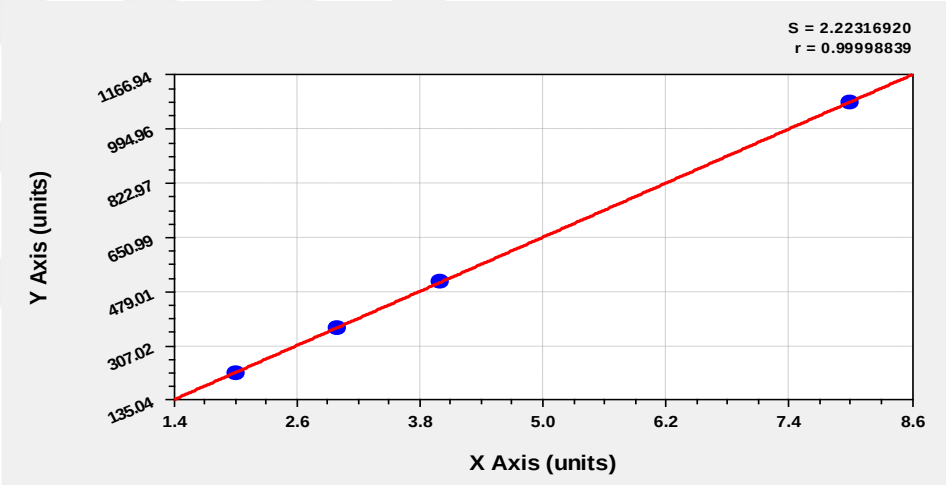


Figure 0.21. Calibration curves of Dieldrin in mixture II of mix A on June and July 2023



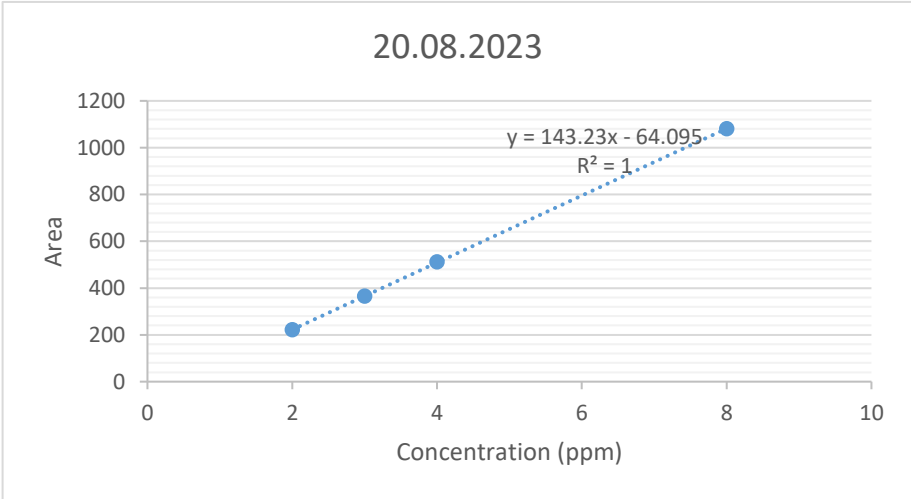


Figure 0.22. Calibration curves of Dieldrin in mixture II of mix A on August 2023

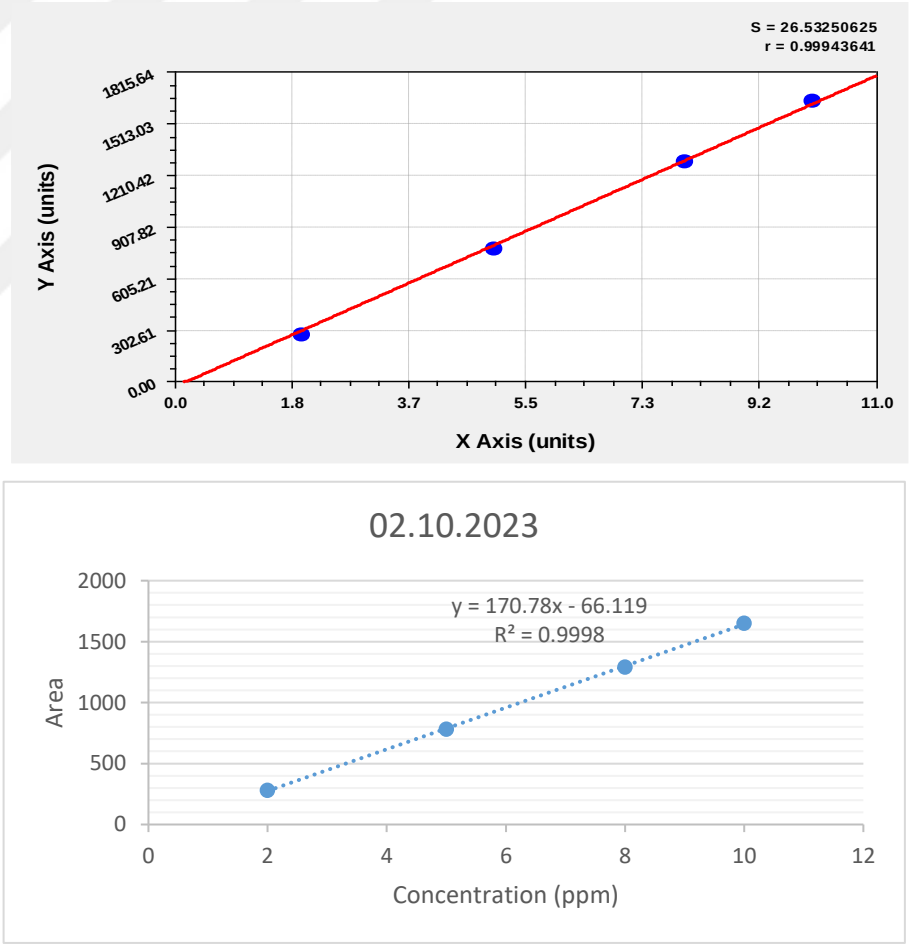


Figure 0.23. Calibration curves of Dieldrin in mixture II of mix A on October 2023

Table 0.108. Names of method for Endrin in mixture II of mix A

endrin in mixture II	
Date	**Method**
11.05.2023	pestisitcalibration
10.06.2023	pestisitcal
19.06.2023	pestisitcal
26.06.2023	pestisitcal
3.07.2023	pestisitcal
20.08.2023	Pestisitcalmix102

Table 0.109. Calculation of uncertainty of calibration curve for Endrin in mixture II of mix A on May 2023

11.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	7
2	119.251	1.62	-4.58	20.97	**C_0 (ppm)**	6
5	335.968	4.57	-1.63	2.67	**C_{ort}**	6.2
6	412.587	5.61	-0.59	0.35	**S**	2.16
8	561.735	7.63	1.43	2.05	**B_1**	$7.36x10^1$
10	706.168	9.60	3.40	11.53	**p**	1
$\bar{C}$=6.2			**S_{xx}**	7	**n**	5
					$u(C_0)$	0.013

Table 0.110. Calculation of uncertainty of calibration curve for Endrin in mixture II of mix A on June and July 2023

10.06.2023 / 19.06.2023 / 26.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	6.8
2	128.078	1.44	-4.76	22.61	**C_0 (ppm)**	6
5	412.673	4.66	-1.54	2.39	**C_{ort}**	6.2
6	482.389	5.44	-0.76	0.58	**S**	9.19
8	667.801	7.53	1.33	1.78	**B_1**	$8.86x10^1$
10	839.412	9.47	3.27	10.69	**p**	1
$\bar{C}$=6.2			**S_{xx}**	6.8	**n**	5
					$u(C_0)$	0.047

Table 0.111. Calculation of uncertainty of calibration curve for Endrin in mixture II of mix A on August 2023

20.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10.1
2	53.641	1.34	-3.66	13.41	**C_0 (ppm)**	3
3	95.277	2.38	-2.62	6.88	**C_{ort}**	5
10	375.007	9.35	4.35	18.95	**S**	1.10
$\bar{C}$=5			**S_{xx}**	10.1	**B_1**	4.01x101
					p	1
					n	3
					$u(C_0)$	0.023

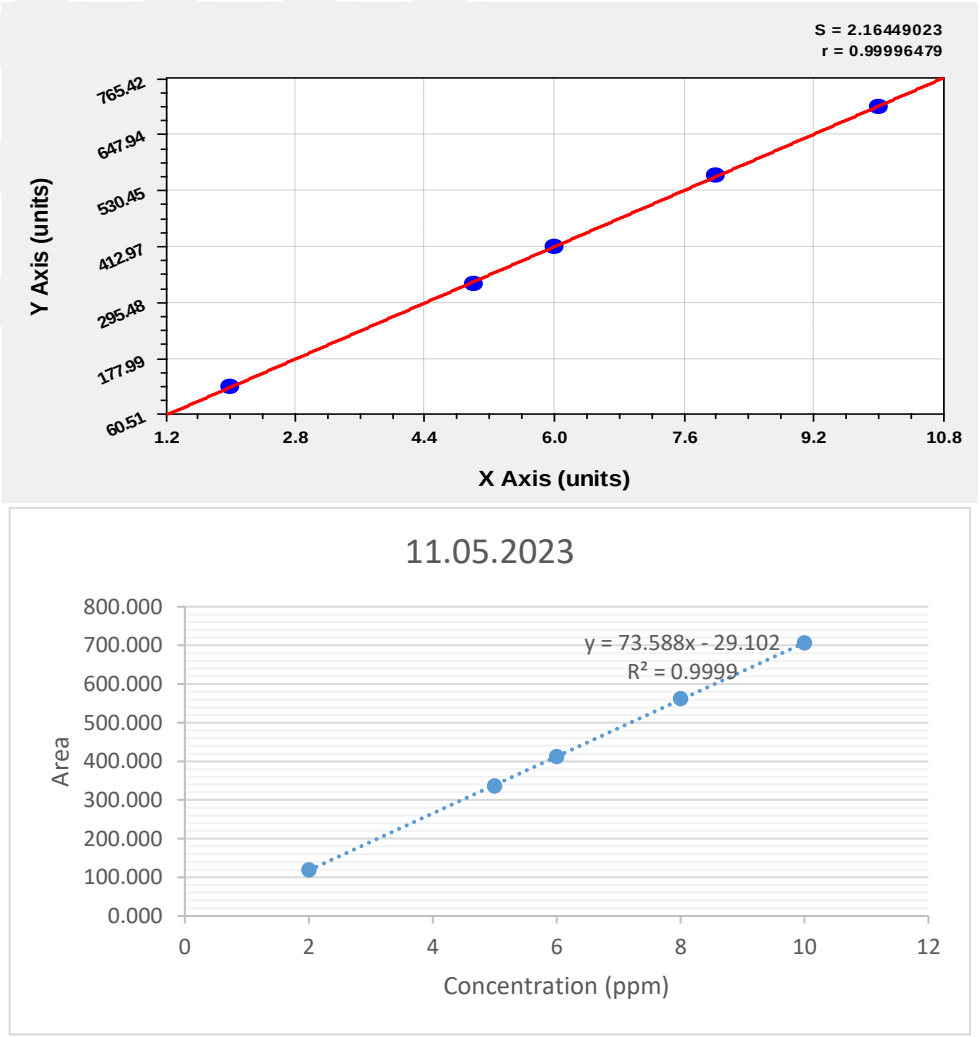
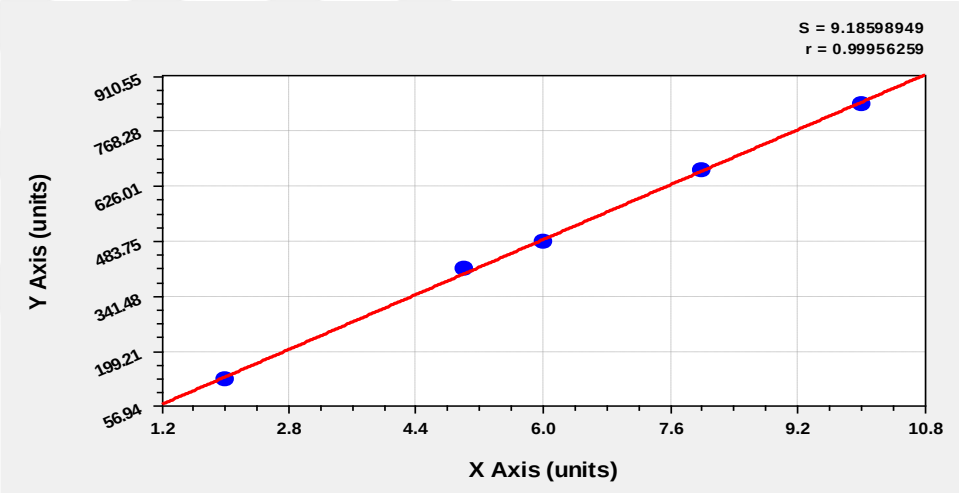


Figure 0.24. Calibration curves of Endrin in mixture II of mix A on May 2023



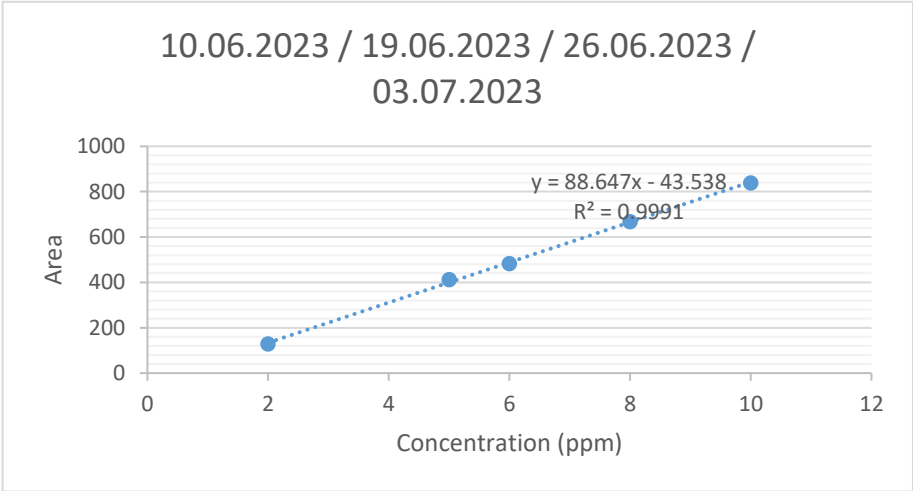
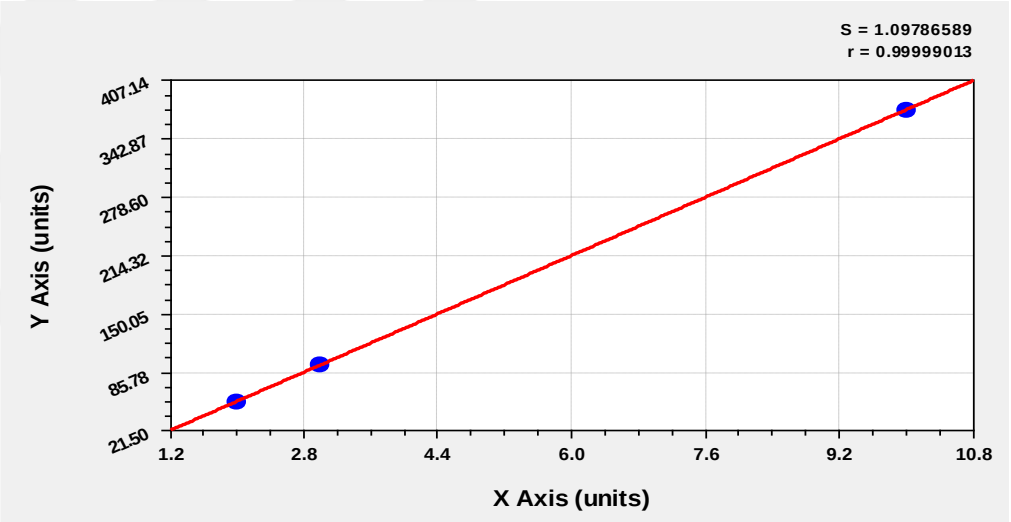


Figure 0.25. Calibration curves of Endrin in mixture II of mix A on June and July 2023



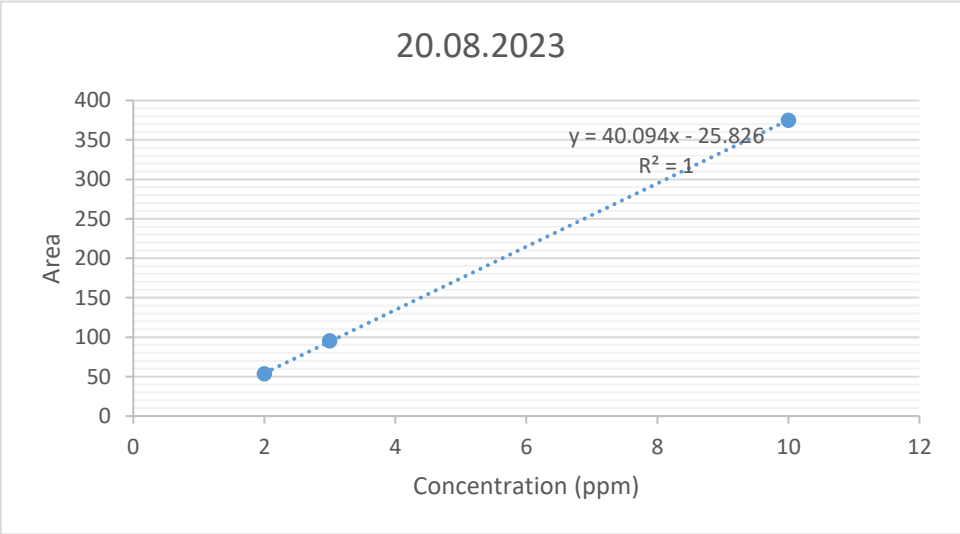


Figure 0.26. Calibration curves of Endrin in mixture II of mix A on August 2023

Table 0.112. Names of method for 4,4'-DDD in mixture II of mix A

4,4'-DDD in mixture II	
Date	**Method**
9.05.2023	pestisitcalibration
10.06.2023	pestisitcal
18.06.2023	pestisitcal
25.06.2023	pestisitcal
3.07.2023	pestisitcal
21.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.113. Calculation of uncertainty of calibration curve for 4,4'-DDD in mixture II of mix A on May 2023

9.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	39
2	660.516	1.34	-3.66	13.38	**C_0 (ppm)**	3
3	1,178.176	2.39	-2.61	6.79	**C_{ort}**	5
10	4,607.489	9.36	4.36	19.04	**S**	18.20
$\bar{C}$=5			**S_{xx}**	39	**B_1**	$4.92x10^2$
					p	1
					n	3
					$u(C_0)$	0.024

Table 0.114. Calculation of uncertainty of calibration curve for 4,4'-DDD in mixture II of mix A on June and July 2023

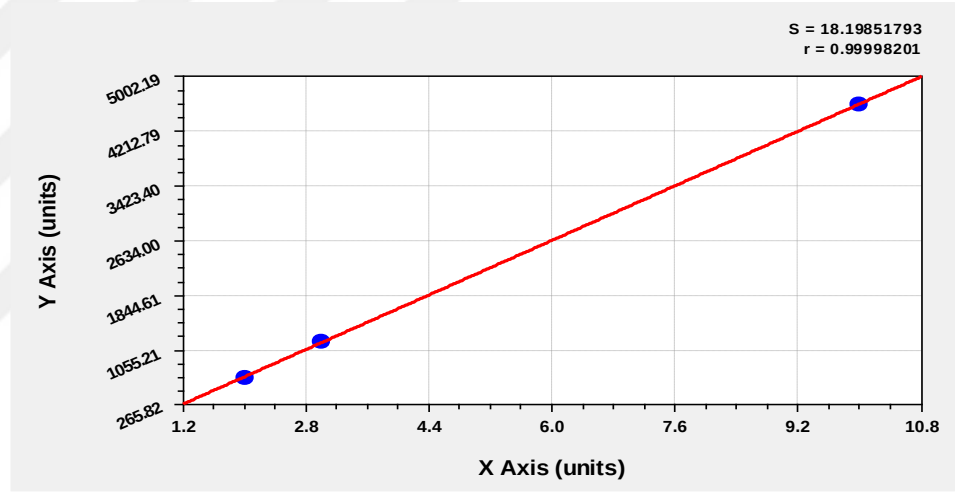
11.06.2023 / 18.06.2023 / 25.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	8.5
2	753.632	1.45	-4.30	18.46	**C_0 (ppm)**	5
5	2365.948	4.56	-1.19	1.41	**C_{ort}**	5.8
6	2826.896	5.45	-0.30	0.09	**S**	33.31
10	4,913.095	9.47	3.72	13.86	**B_1**	$5.19x10^2$
$\bar{C}$=5.8			**S_{xx}**	8.5	**p**	1
					n	4
					$u(C_0)$	0.036

Table 0.115. Calculation of uncertainty of calibration curve for 4,4'-DDD in mixture II of mix A on August 2023

21.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	13.1
2	413.747	1.29	-3.71	13.79	**C_0 (ppm)**	3
3	766.39	2.38	-2.62	6.85	**C_{ort}**	5
10	2,999.850	9.32	4.32	18.70	**S**	22.01
$\bar{C}$=5			**S_{xx}**	13.1	**B_1**	$3.22x10^2$
					p	1
					n	3
					$u(C_0)$	0.05

Table 0.116. Calculation of uncertainty of calibration curve for 4,4'-DDD in mixture II of mix A on October 2023

02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10.6
2	413.747	1.28	-3.72	13.84	**C_0 (ppm)**	3
3	735.821	2.28	-2.72	7.42	**C_{ort}**	5
10	2,999.850	9.28	4.28	18.30	**S**	0.891
$\overline{C}$=5			**S_{xx}**	10.6	**B_1**	$3.23x10^2$
					p	1
					n	3
					$u(C_0)$	0.002



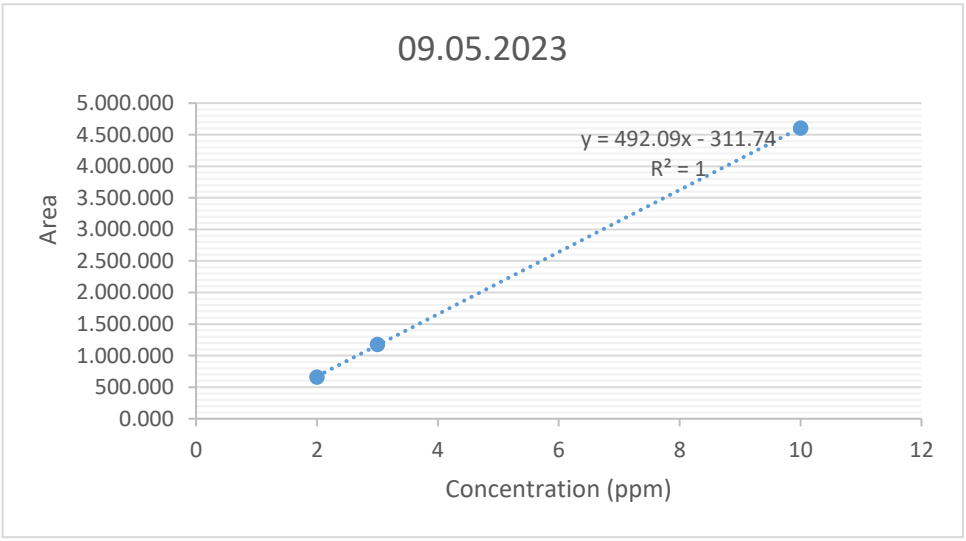
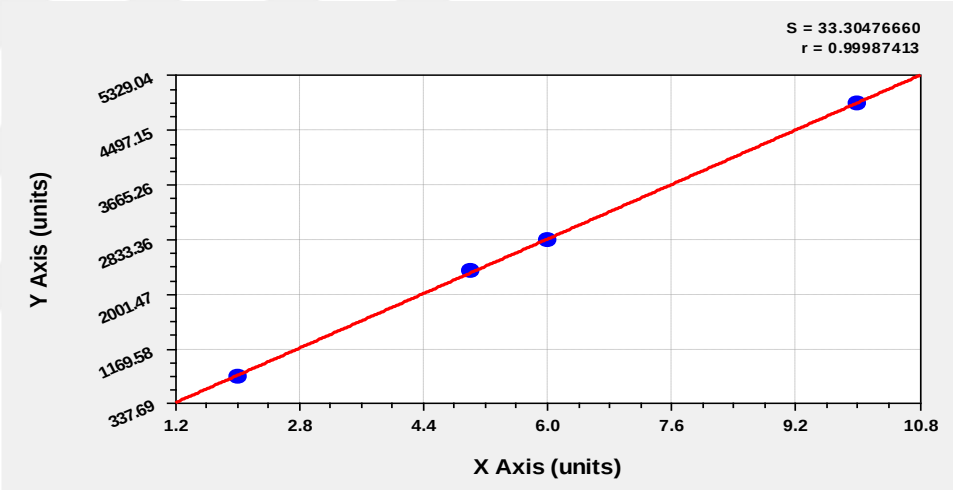


Figure 0.27. Calibration curves of 4,4’-DDD in mixture II of mix A on May 2023



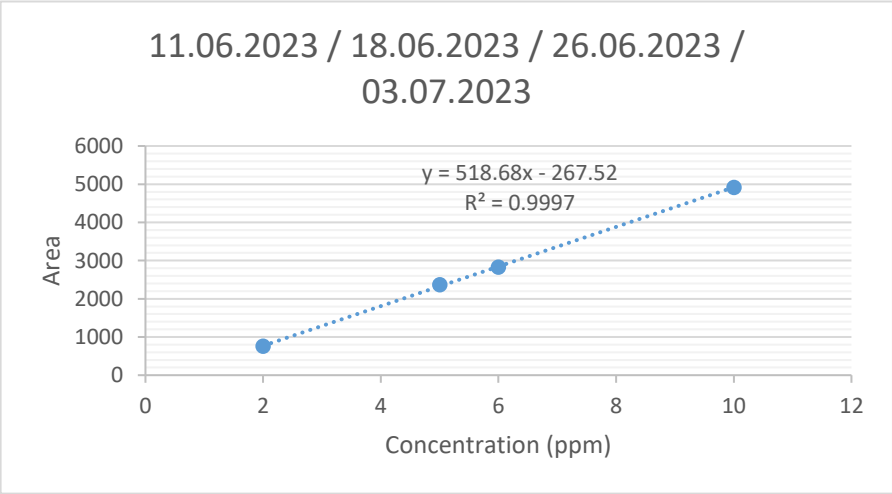
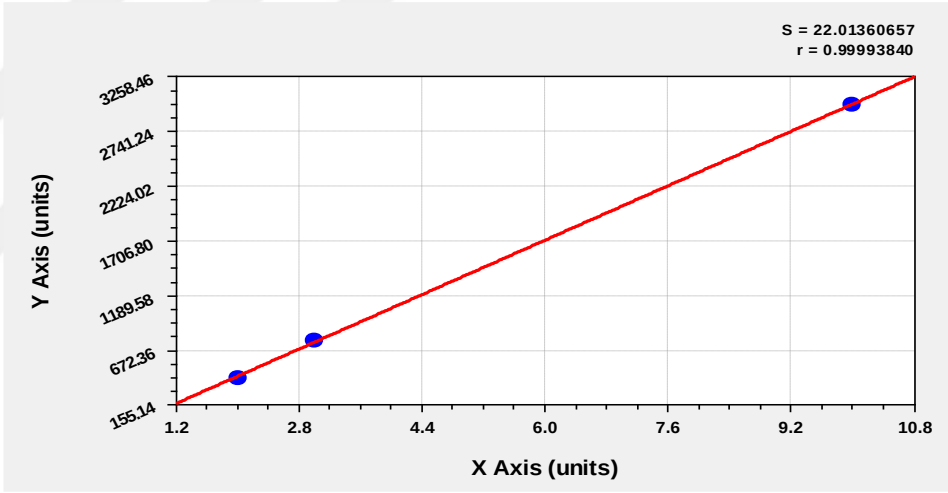


Figure 0.28. Calibration curves of 4,4'-DDD in mixture II of mix A on June and July 2023



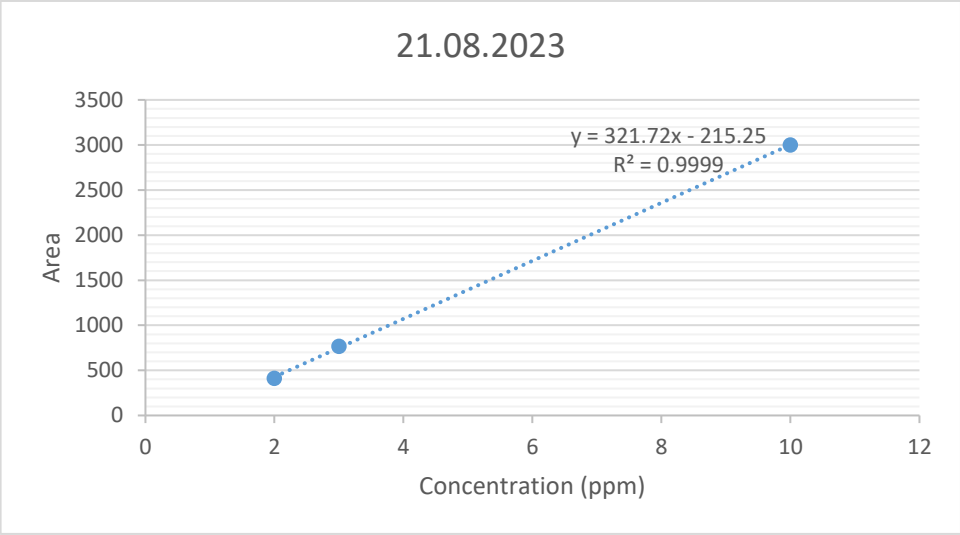
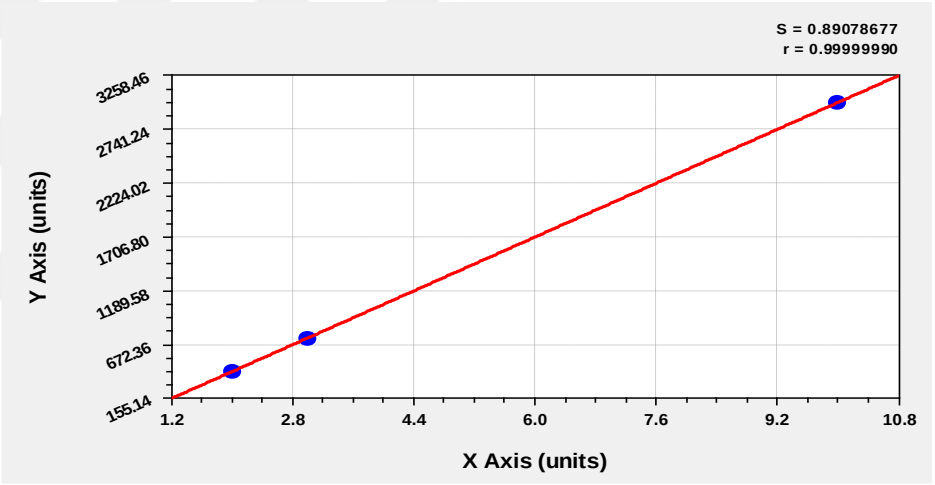


Figure 0.29. Calibration curves of 4,4'-DDD in mixture II of mix A on August 2023



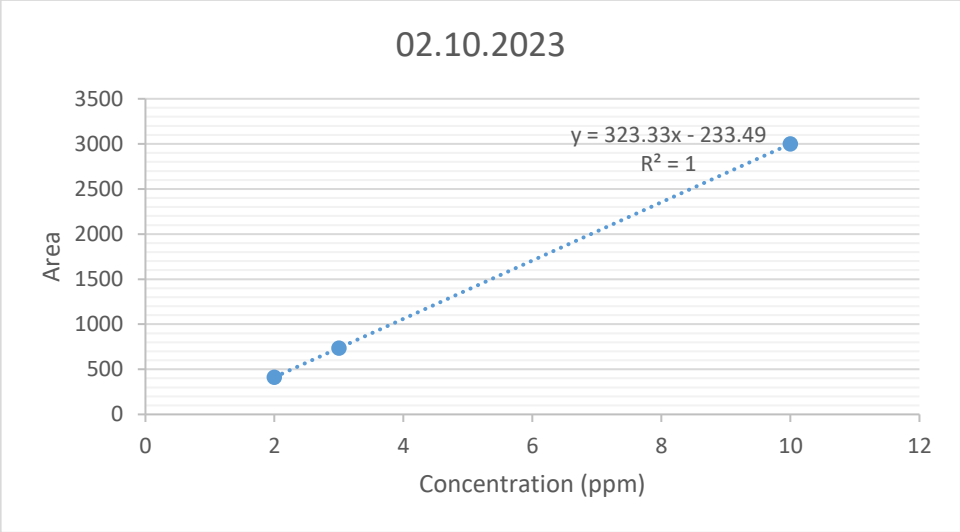


Figure 0.30. Calibration curves of 4,4'-DDD in mixture II of mix A on October 2023

Table 0.117. Names of method for 4,4'-DDT in mixture II of mix A

4,4'-DDT in mixture II	
Date	**Method**
9.05.2023	pestisitcalibration
11.06.2023	pestisitcal
19.06.2023	pestisitcal
26.06.2023	pestisitcal
3.07.2023	pestisitcal
28.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.118. Calculation of uncertainty of calibration curve for 4,4'-DDT in mixture II of mix A on May 2023

9.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	12
2	370.859	0.82	-5.18	26.82	**C_0 (ppm)**	6
6	2,169.454	4.80	-1.20	1.43	**C_{ort}**	6
10	3,984.093	8.82	2.82	7.96	**S**	6.55
$\bar{C}$=6			**S_{xx}**	12	**B_1**	$4.52x10^2$
					p	1
					n	3
					$u(C_0)$	0.008

Table 0.119. Calculation of uncertainty of calibration curve for 4,4'-DDT in mixture II of mix A on June and July 2023

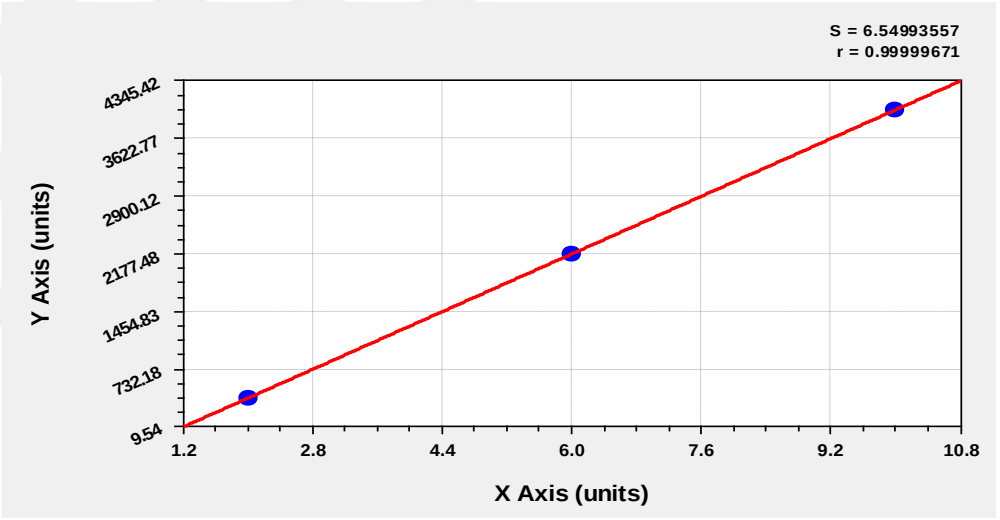
11.06.2023 / 19.06.2023 / 26.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	9.8
2	690.331	1.29	-4.96	24.59	**C_0 (ppm)**	6
5	2311.195	4.32	-1.93	3.72	**C_{ort}**	6.2
8	3891.102	7.28	1.03	1.05	**S**	13.11
10	4,978.040	9.31	3.06	9.35	**B_1**	$5.35x10^2$
$\bar{C}$=6.2			**S_{xx}**	9.8	**p**	1
					n	4
					$u(C_0)$	0.012

Table 0.120. Calculation of uncertainty of calibration curve for 4,4'-DDT in mixture II of mix A on August 2023

28.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	13.9
2	169.511	0.91	-4.09	16.71	**C_0 (ppm)**	3
3	355.233	1.91	-3.09	9.54	**C_{ort}**	5
10	1,656.174	8.91	3.91	15.30	**S**	0.08
$\bar{C}$=5			**S_{xx}**	13.9	**B_1**	$1.86x10^2$
					p	1
					n	3
					$u(C_0)$	0.0003

Table 0.121. Calculation of uncertainty of calibration curve for 4,4'-DDT in mixture II of mix A on October 2023

02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10.2
2	190.415	0.98	-5.27	27.81	**C_0 (ppm)**	5
5	776.58	3.98	-2.27	5.15	**C_{ort}**	6.3
8	1367.69	7.01	0.76	0.58	**S**	5.0
10	1,748.009	8.96	2.71	7.35	**B_1**	$1.95x10^2$
$\bar{C}$=6.3			**S_{xx}**	10.2	**p**	1
					n	4
					$u(C_0)$	0.016



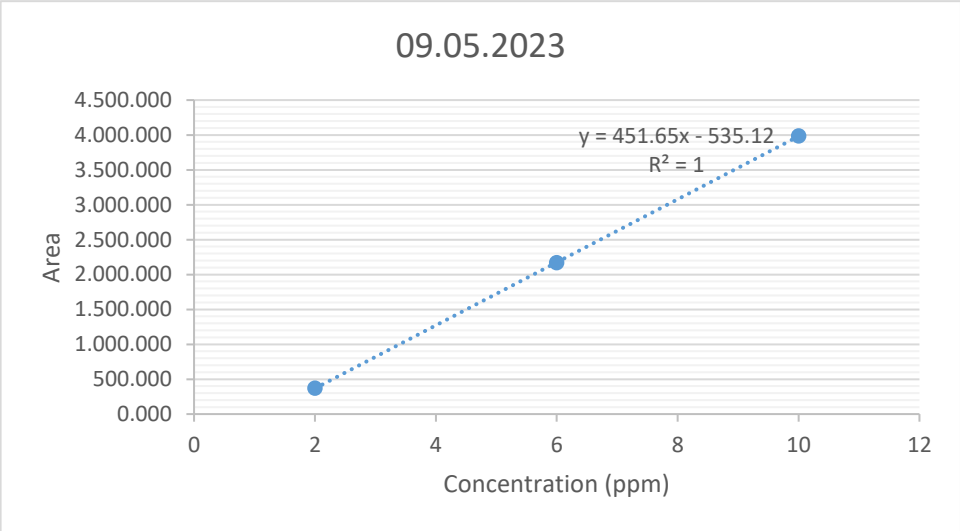


Figure 0.31. Calibration curves of 4,4'-DDT in mixture II of mix A on May 2023

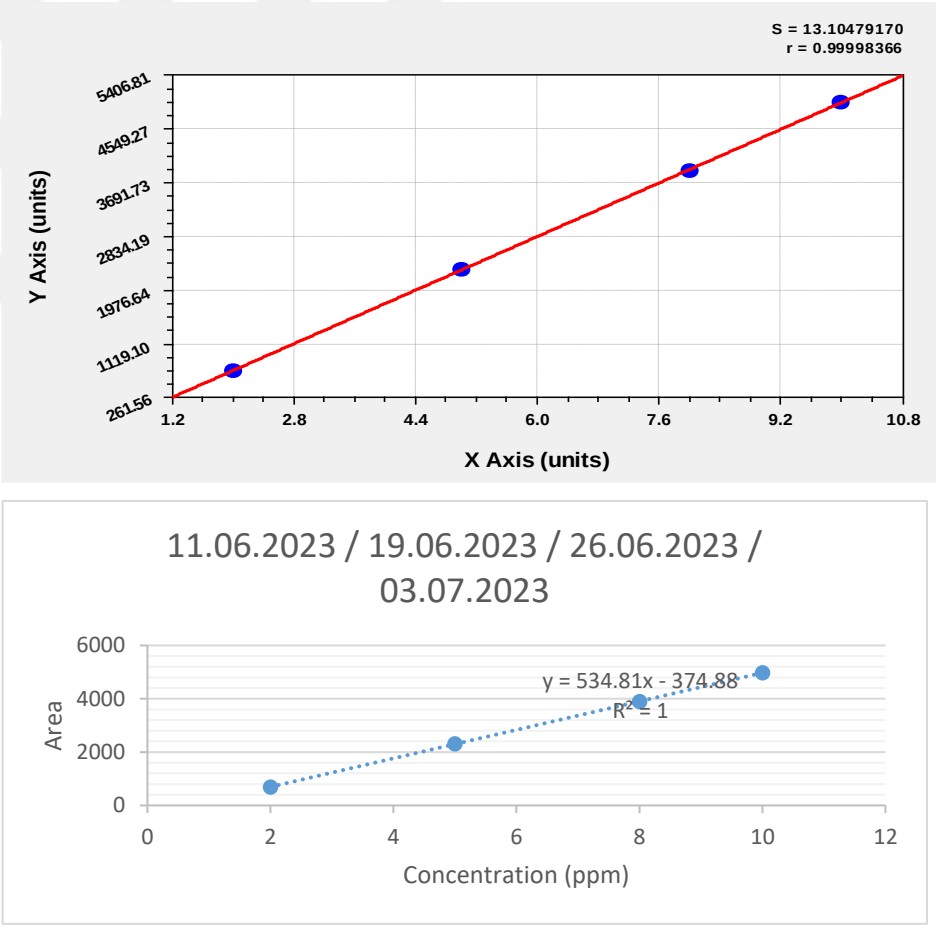


Figure 0.32. Calibration curves of 4,4'-DDT in mixture II of mix A on June and July 2023

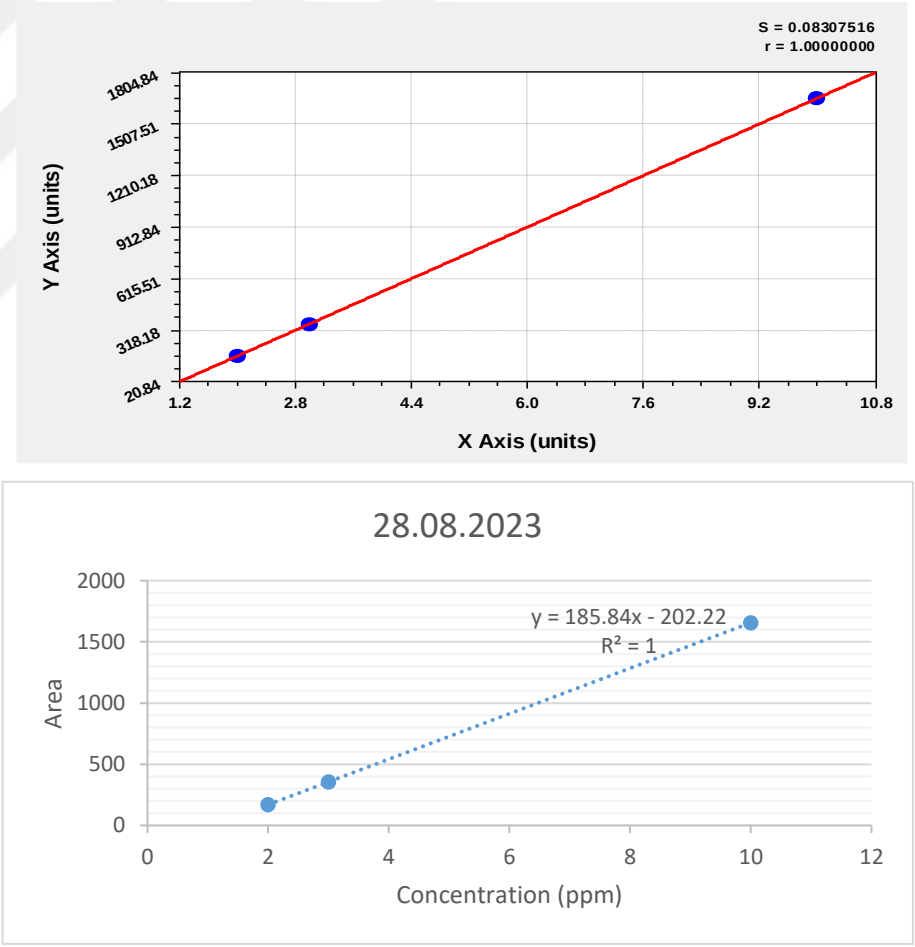


Figure 0.33. Calibration curves of 4,4'-DDT in mixture II of mix A on August 2023

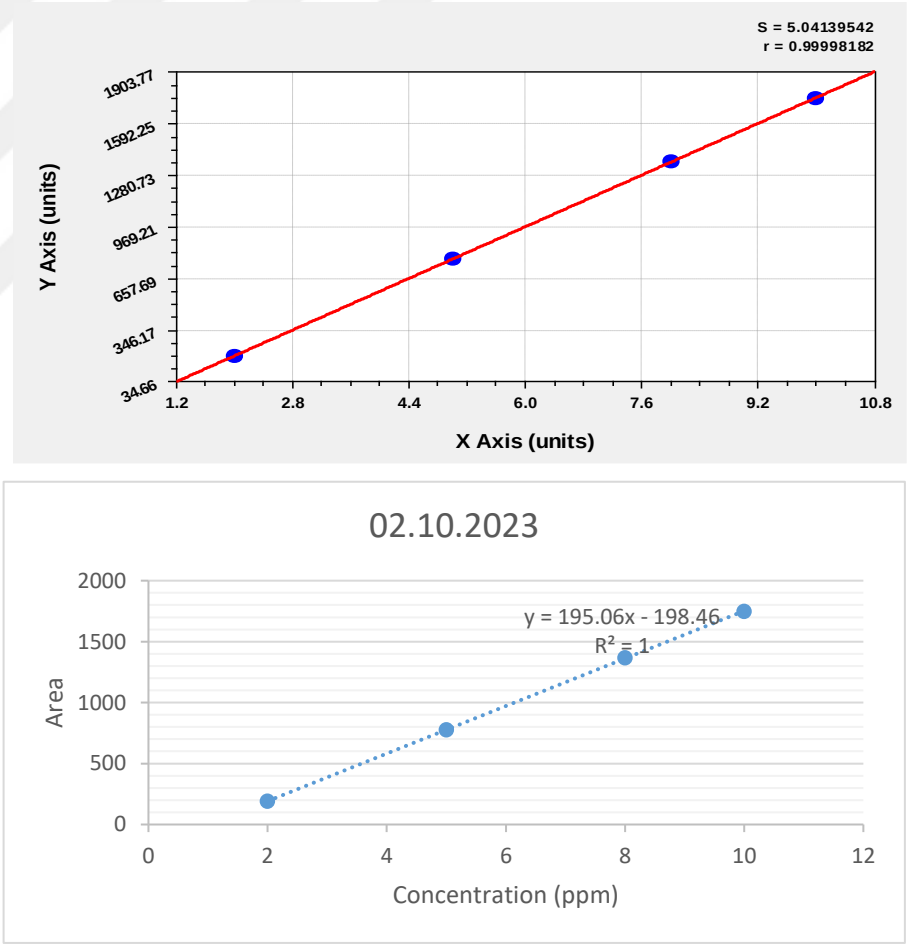


Figure 0.34. Calibration curves of 4,4'-DDT in mixture II of mix A on October 2023

Table 0.122. Names of method for 2,4'-DDT in mixture II of mix A

2,4'-DDT in mixture II	
Date	**Method**
9.05.2023	pestisitcalibration
11.06.2023	pestisitcal
19.06.2023	pestisitcal
26.06.2023	pestisitcal
3.07.2023	pestisitcal
28.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.123. Calculation of uncertainty of calibration curve for 2,4'-DDT in mixture II of mix A on May 2023

9.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10
2	364.553	1.02	-5.48	30.02	**C_0 (ppm)**	6
6	1,779.702	4.98	-1.52	2.30	**C_{ort}**	6.5
8	2,496.697	6.99	0.49	0.24	**S**	9.89
10	3,224.901	9.03	2.53	6.39	**B_1**	$3.57x10^2$
$\bar{C}$=6.5			**S_{xx}**	10	**p**	1
					n	4
					$u(C_0)$	0.015

Table 0.124. Calculation of uncertainty of calibration curve for 2,4'-DDT in mixture II of mix A on June and July 2023

11.06.2023 / 19.06.2023 / 26.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	11.8
2	433.453	0.97	-5.03	25.26	**C_0 (ppm)**	6
6	2156.265	4.85	-1.15	1.33	**C_{ort}**	6
10	3,993.659	8.97	2.97	8.84	**S**	46.78
$\bar{C}$=6			**S_{xx}**	11.8	**B_1**	4.45×10^2
					p	1
					n	3
					$u(C_0)$	0.061

Table 0.125. Calculation of uncertainty of calibration curve for 2,4'-DDT in mixture II of mix A on August and October 2023

28.08.2023 / 02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	14.0
2	131.938	0.83	-4.17	17.43	**C_0 (ppm)**	3
3	292.153	1.83	-3.17	10.07	**C_{ort}**	5
10	1,411.358	8.83	3.83	14.64	**S**	0.22
$\bar{C}$=5			**S_{xx}**	14.0	**B_1**	1.60×10^2
					p	1
					n	3
					$u(C_0)$	0.001

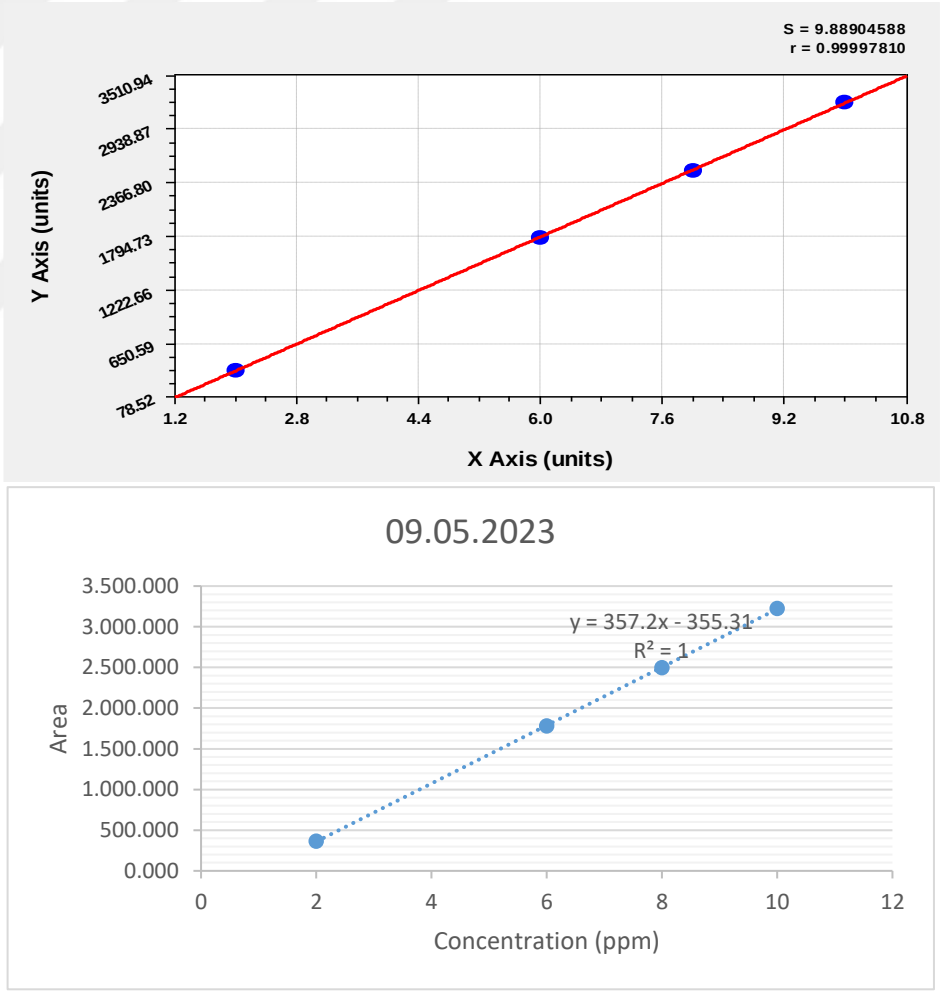
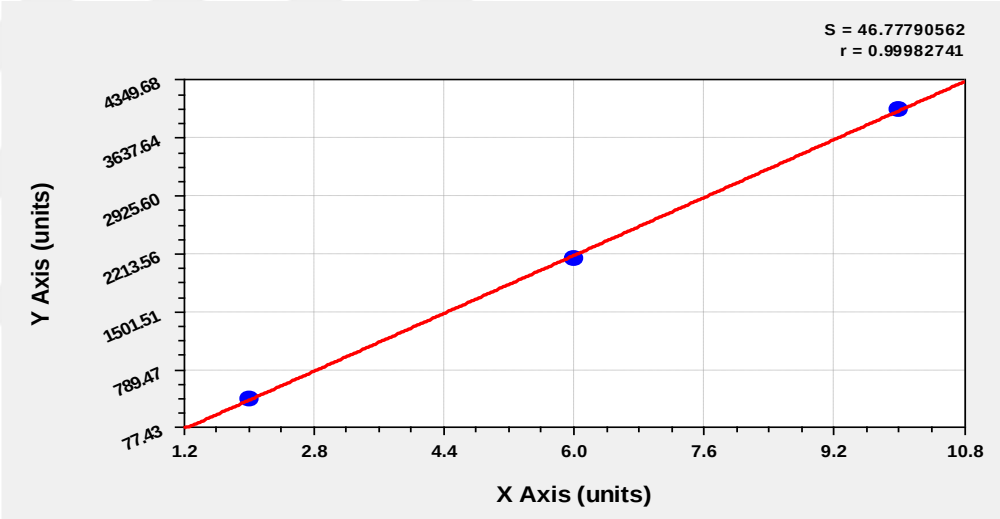


Figure 0.35. Calibration curves of 2,4'-DDT in mixture II of mix A on May 2023



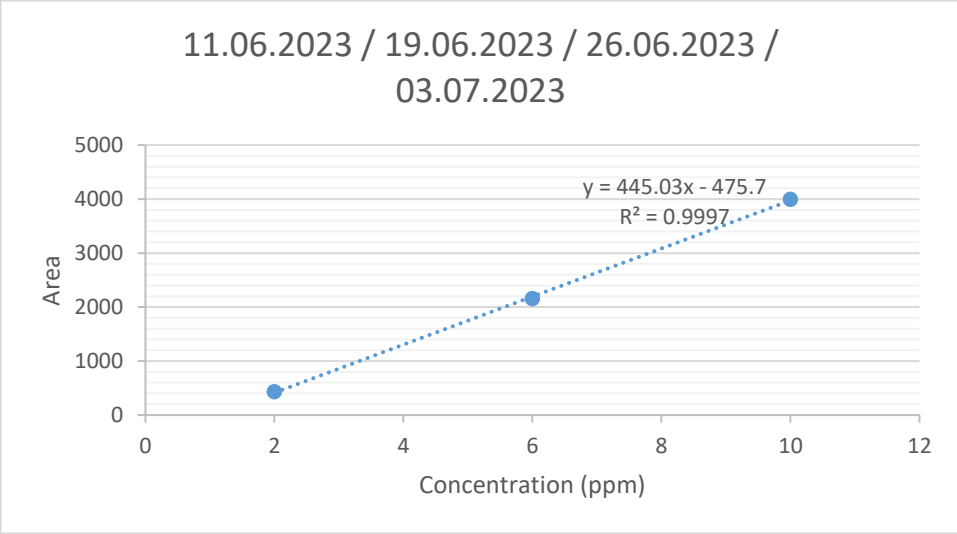
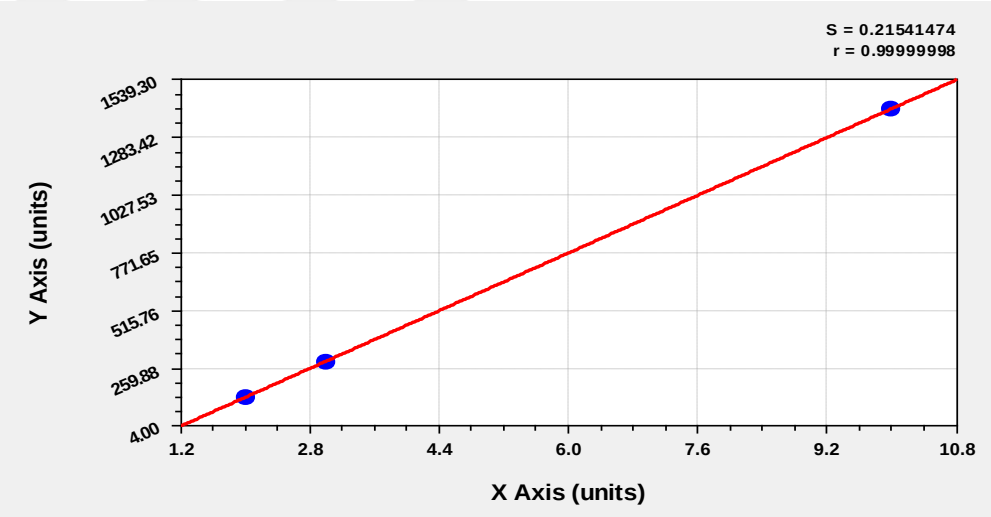


Figure 0.36. Calibration curves of 2,4’-DDT in mixture II of mix A on June and July 2023



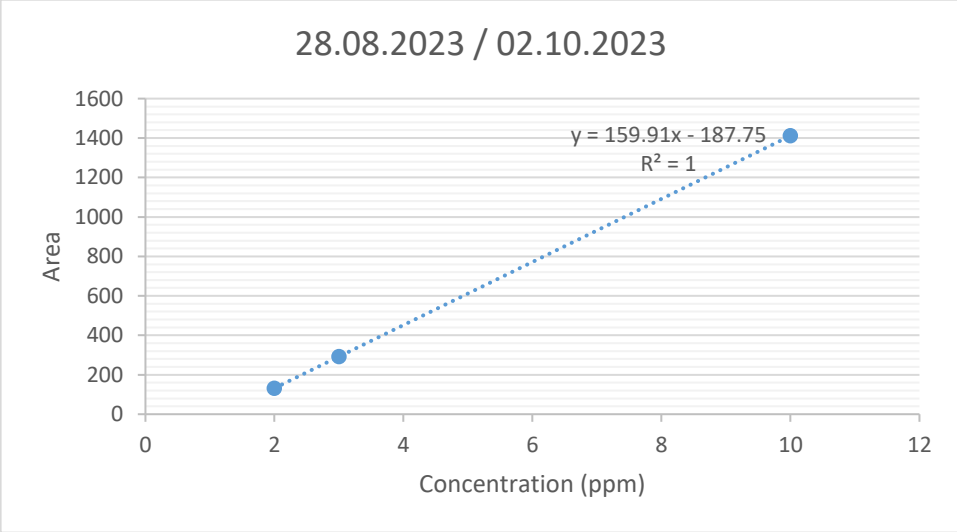


Figure 0.37. Calibration curves of 2,4'-DDT in mixture II of mix A on August and October 2023

Table 0.126. Names of method for *alpha*-Endosulfan in mixture II of mix A

***alpha*-endosulfan in mixture II**	
Date	**Method**
9.05.2023	pestisitcalibration
11.06.2023	pestisitcal
19.06.2023	pestisitcal
25.06.2023	pestisitcal
3.07.2023	pestisitcal
20.08.2023	Pestisitcalmix102
21.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.127. Calculation of uncertainty of calibration curve for *alpha*-Endosulfan in mixture II of mix A on May, June and July 2023

09.05.2023 / 11.06.2023 / 19.06.2023 / 25.06.2023 / 03.07 2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	7
2	36.448	1.85	-4.35	18.93	**C_0 (ppm)**	6
5	95.000	4.82	-1.38	1.90	**C_{ort}**	6.2
6	113.775	5.77	-0.43	0.18	**S**	1.316
8	154.127	7.82	1.62	2.63	**B_1**	$1.97x10^1$
10	194.105	9.85	3.65	13.32	**p**	1
$\bar{C}$=6.2			**S_{xx}**	7	**n**	5
					$u(C_0)$	**0.030**

Table 0.128. Calculation of uncertainty of calibration curve for *alpha*-Endosulfan in mixture II of mix A on August 2023

20.08.2023 / 21.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	9.7
2	29.28	1.75	-3.00	9.01	**C_0 (ppm)**	4
3	46.247	2.76	-1.99	3.96	**C_{ort}**	4.8
4	63.692	3.80	-0.95	0.90	**S**	0.49
10	163.473	9.76	5.01	25.10	**B_1**	$1.67x10^1$
$\bar{C}$=4.8			**S_{xx}**	9.7	**p**	1
					n	4
					$u(C_0)$	0.06

Table 0.129. Calculation of uncertainty of calibration curve for *alpha*-Endosulfan in mixture II of mix A on October 2023

02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	9.2
2	36.843	1.78	-4.47	20.02	**C_0 (ppm)**	8
5	98.588	4.75	-1.50	2.25	**C_{ort}**	6.3
8	161.203	7.77	1.52	2.30	**S**	0.36
10	202.773	9.77	3.52	12.40	**B_1**	$2.08x10^1$
$\bar{C}$=5			**S_{xx}**	9.2	**p**	1
					n	4
					$u(C_0)$	0.014

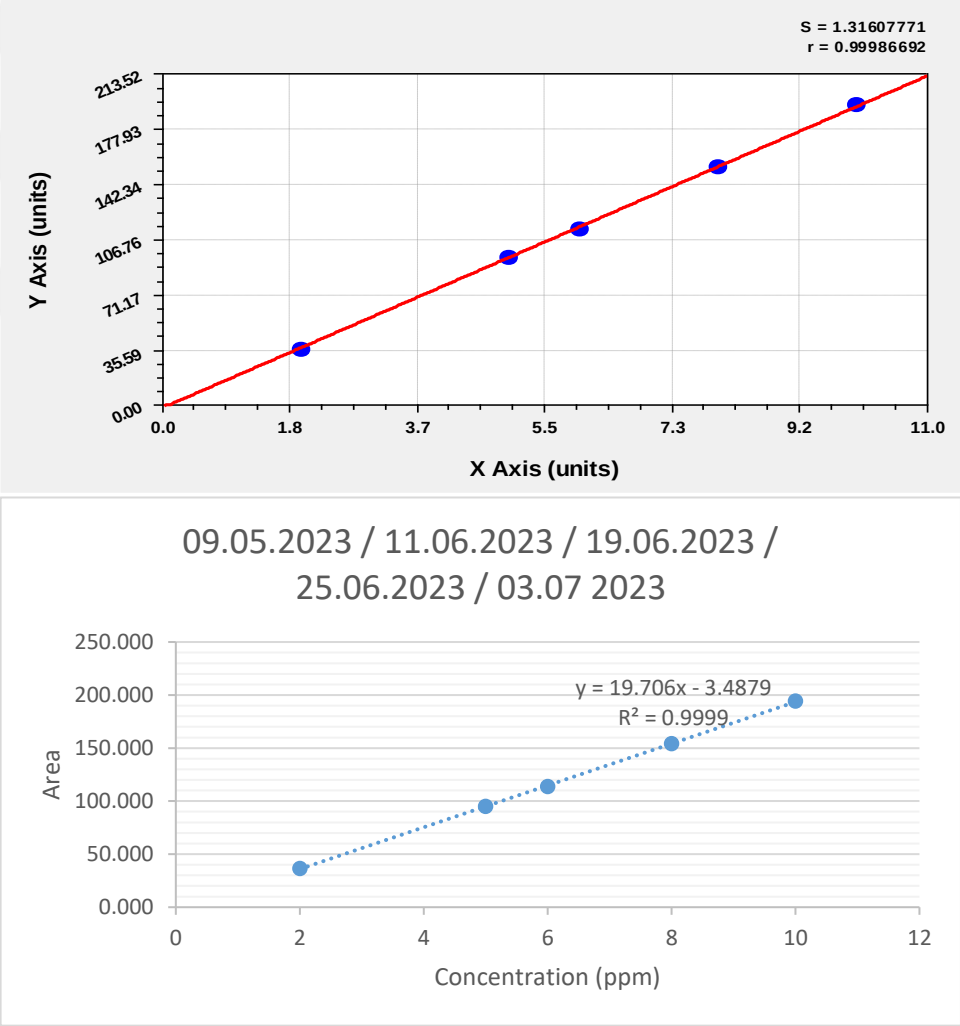


Figure 0.38. Calibration curves of *alpha*-Endosulfan in mixture II of mix A on May, June and July 2023

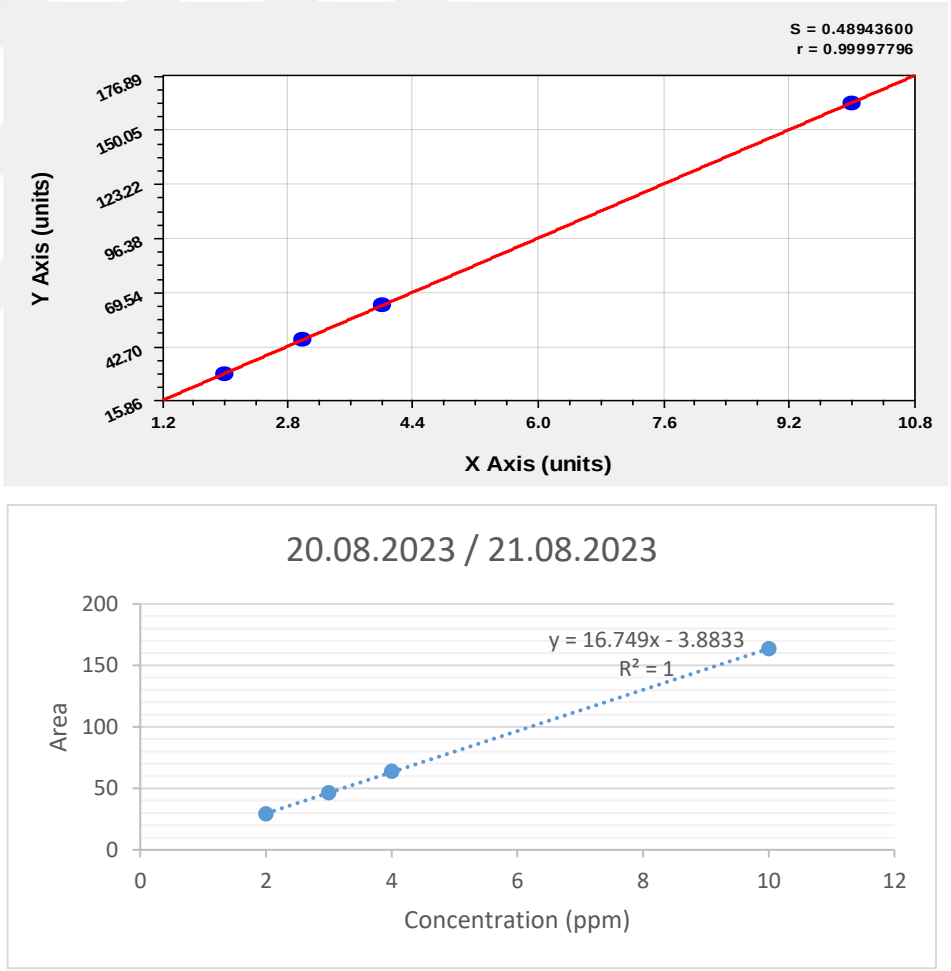
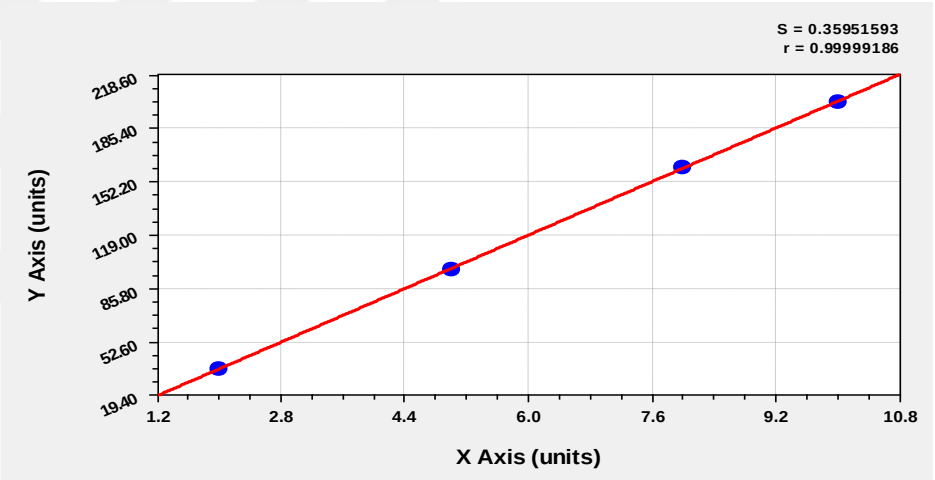


Figure 0.39. Calibration curves of *alpha*-Endosulfan in mixture II of mix A on August 2023



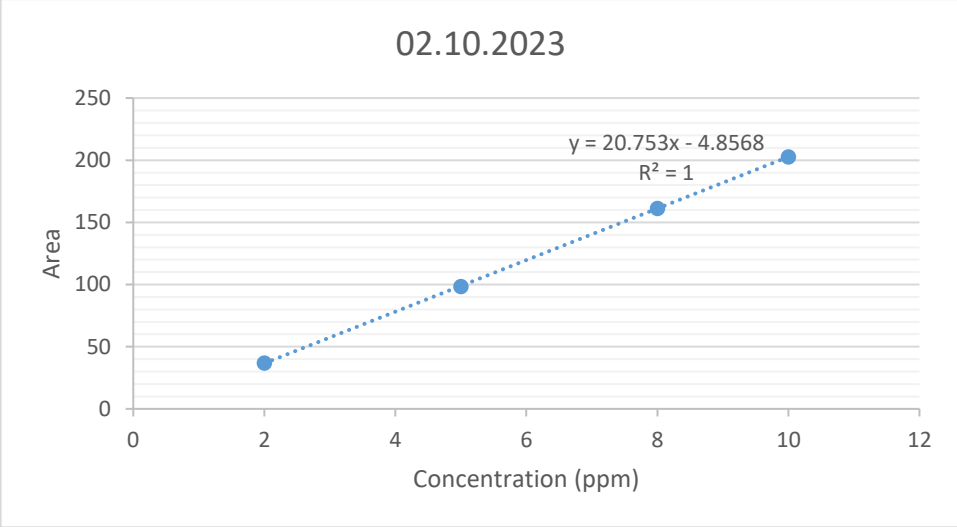


Figure 0.40. Calibration curves of *alpha*-Endosulfan in mixture II of mix A on October 2023

Table 0.130. Names of method for *beta*-Endosulfan in mixture II of mix A

***beta*-endosulfan in mixture II**	
Date	**Method**
9.05.2023	pestisitcalibration
11.06.2023	pestisitcal
19.06.2023	pestisitcal
26.06.2023	pestisitcal
3.07.2023	pestisitcal
21.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.131. Calculation of uncertainty of calibration curve for *beta*-Endosulfan in mixture II of mix A on May 2023

9.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	11
2	84.125	1.55	-4.20	17.64	**C_0 (ppm)**	8
3	137.516	2.53	-3.22	10.34	**C_{ort}**	5.8
8	410.535	7.56	1.81	3.29	**S**	1.011
10	517.331	9.53	3.78	14.30	**B_1**	$5.43x10^1$
$\bar{C}$=5.8			**S_{xx}**	11	**p**	1
					n	4
					u(C_0)	0.016

Table 0.132. Calculation of uncertainty of calibration curve for *beta*-Endosulfan in mixture II of mix A on June and July 2023

11.06.2023 / 19.06.2023 / 26.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	5.9
2	58.142	1.90	-4.30	18.47	**C_0 (ppm)**	6
5	148.959	4.87	-1.33	1.76	**C_{ort}**	6.2
6	178.558	5.84	-0.36	0.13	**S**	1.33
8	242.808	7.95	1.75	3.05	**B_1**	$3.06x10^1$
10	301.610	9.87	3.67	13.47	**p**	1
$\bar{C}$=6.2			**S_{xx}**	5.9	**n**	5
					$u(C_0)$	0.02

Table 0.133. Calculation of uncertainty of calibration curve for *beta*-Endosulfan in mixture II of mix A on August 2023

21.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	7.1
3	61.537	2.70	-3.55	12.63	**C_0 (ppm)**	4
4	83.895	3.67	-2.58	6.63	**C_{ort}**	6.3
8	176.343	7.72	1.47	2.17	**S**	0.98
10	220.755	9.67	3.42	11.69	**B_1**	$2.28x10^1$
$\bar{C}$=6.3			**S_{xx}**	7.1	**p**	1
					n	4
					$u(C_0)$	0.042

Table 0.134. Calculation of uncertainty of calibration curve for *beta*-Endosulfan in mixture II of mix A on October 2023

02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	8.4
2	47.747	1.72	-4.53	20.56	**C_0 (ppm)**	5
5	129.629	4.66	-1.59	2.54	**C_{ort}**	6.3
8	215.037	7.73	1.48	2.18	**S**	1.04
10	269.736	9.69	3.44	11.84	**B_1**	$2.78x10^1$
$\bar{C}$=6.3			**S_{xx}**	8.4	**p**	1
					n	4
					$u(C_0)$	0.025

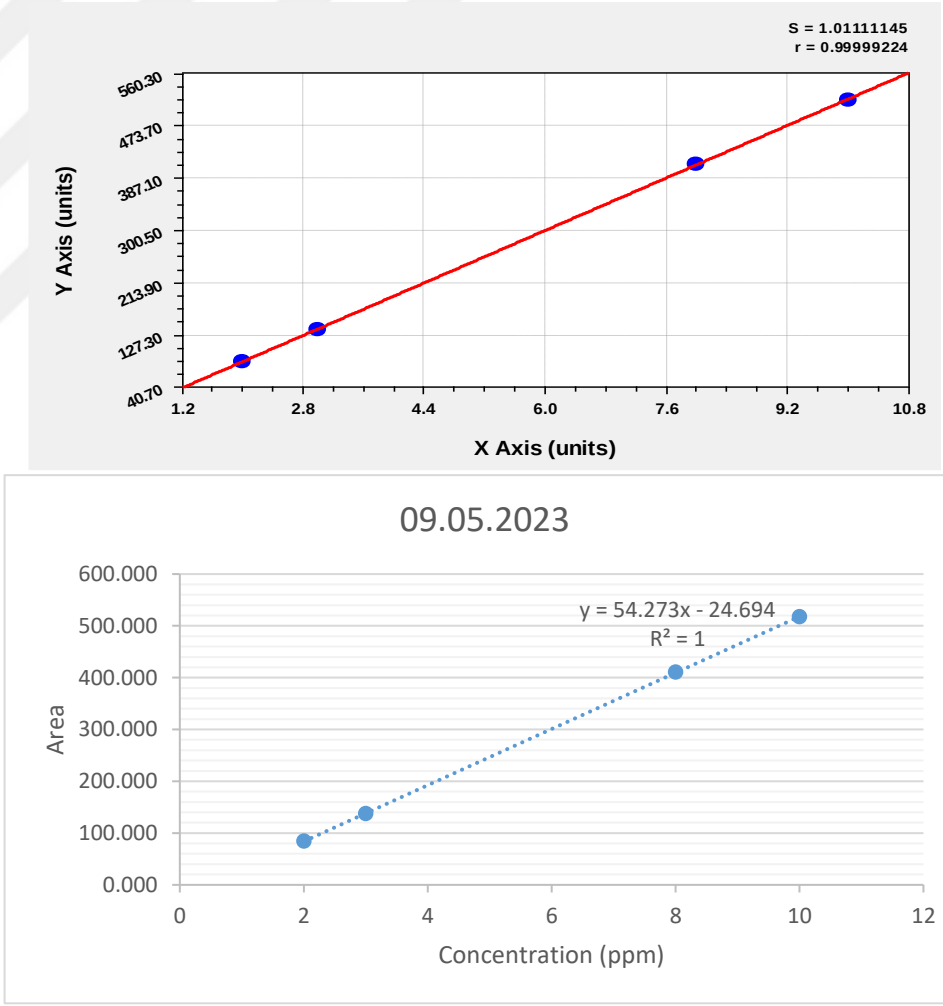
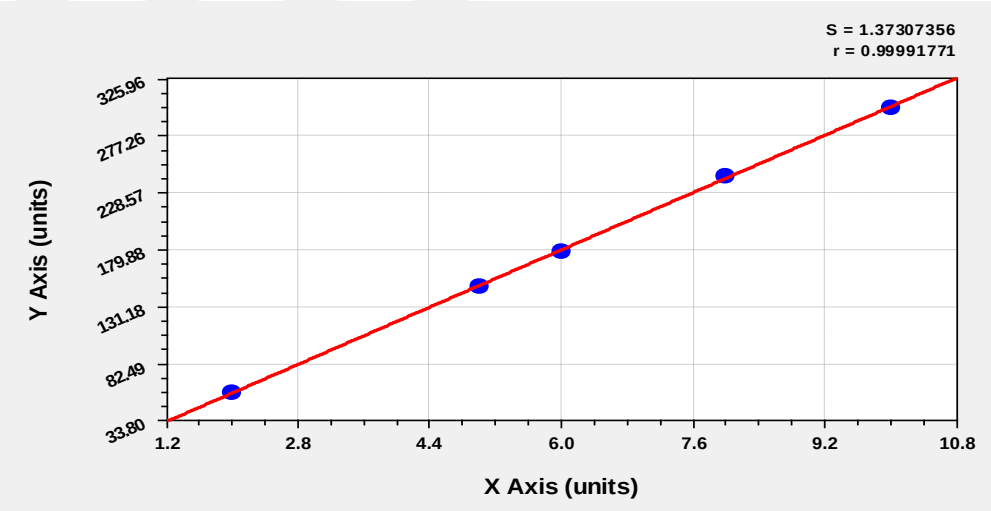


Figure 0.41. Calibration curves of *beta*-Endosulfan in mixture II of mix A on May 2023



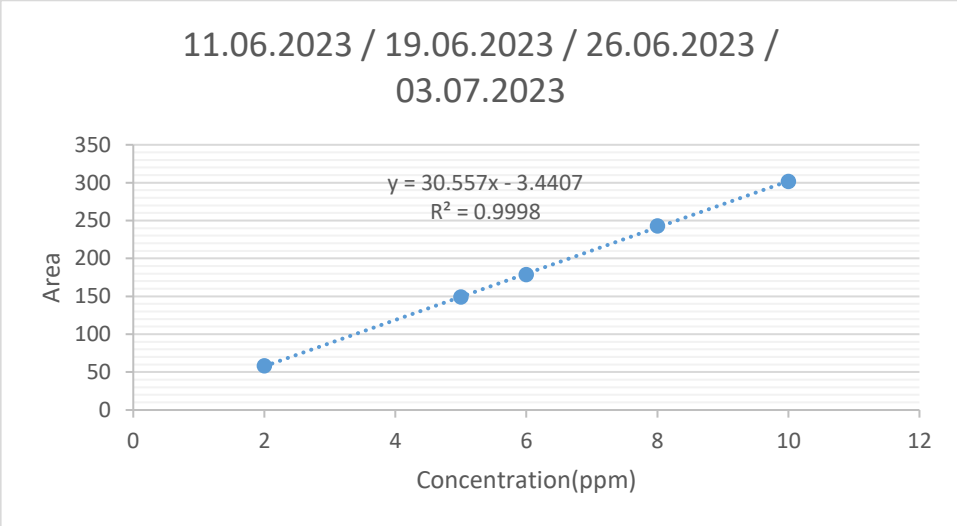
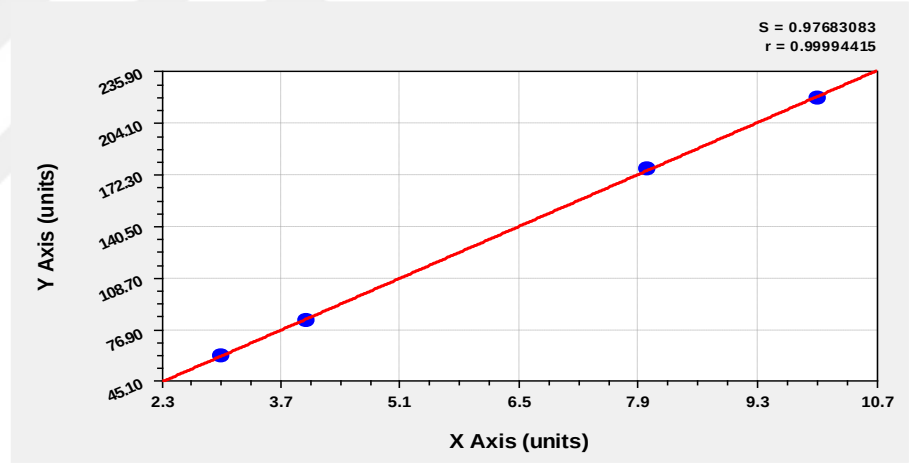


Figure 0.42. Calibration curves of *beta*-Endosulfan in mixture II of mix A on June and July 2023



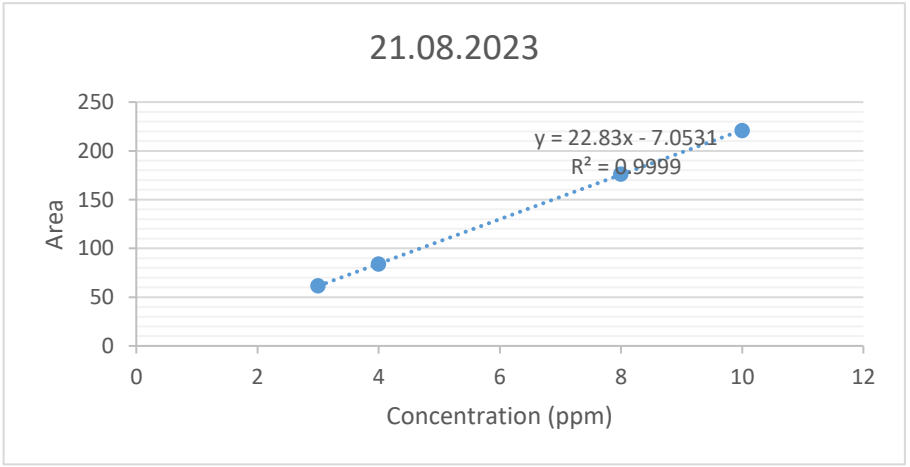


Figure 0.43. Calibration curves of *beta*-Endosulfan in mixture II of mix A on August 2023

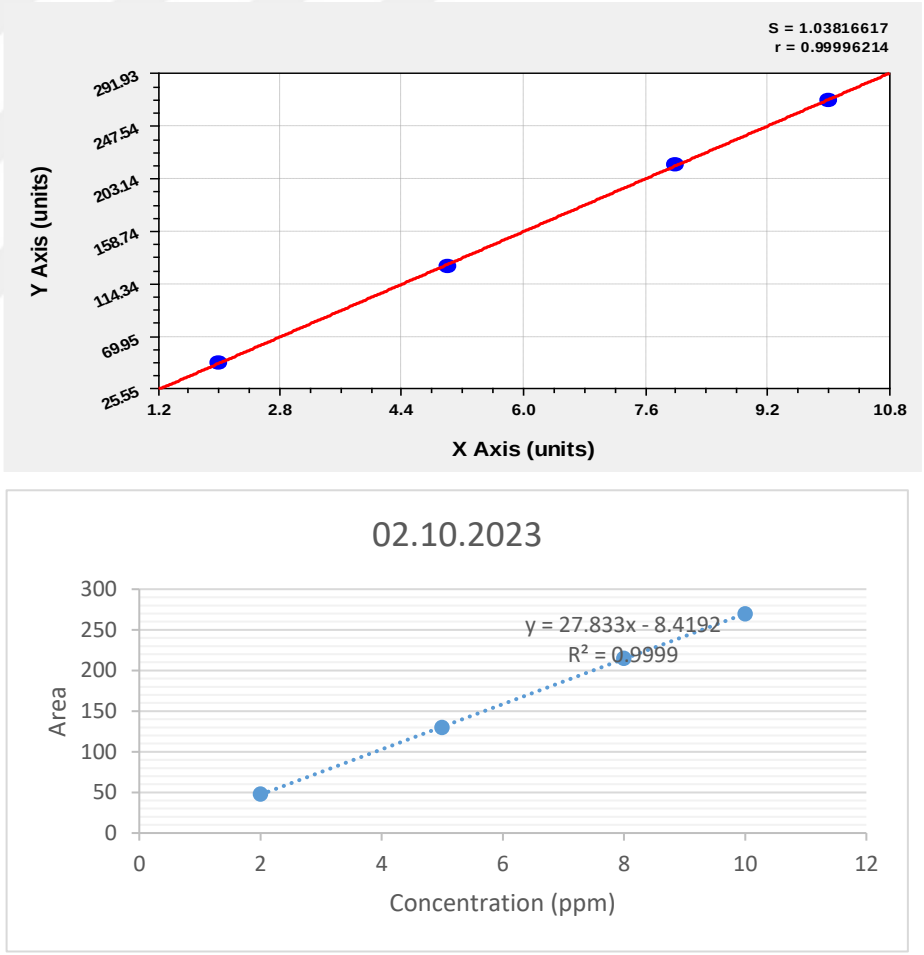


Figure 0.44. Calibration curves of *beta*-Endosulfan in mixture II of mix A on October 2023

Table 0.135. Names of method for Heptachlor in mixture II of mix A

heptachlor in mixture II	
Date	**Method**
9.05.2023	pestisitcalibration
11.06.2023	pestisitcal
18.06.2023	pestisitcal
26.06.2023	pestisitcal
3.07.2023	pestisitcal
20.08.2023	Pestisitcalmix102
21.08.2023	Pestisitcalmix102

Table 0.136. Calculation of uncertainty of calibration curve for Heptachlor in mixture II of mix A on May 2023

9.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10
3	325.972	1.72	-4.28	18.34	**C_0 (ppm)**	5
5	712.343	3.75	-2.25	5.05	**C_{ort}**	6
10	1,656.042	8.73	2.73	7.43	**S**	5.03
$\bar{C}$=6			**S_{xx}**	10	**B_1**	$1.90x10^2$
					p	1
					n	3
					$u(C_0)$	0.02

Table 0.137. Calculation of uncertainty of calibration curve for Heptachlor in mixture II of mix A on June and July 2023

10.06.2023 / 18.06.2023 / 25.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	7.5
2	355.065	1.29	-4.91	24.09	**C_0 (ppm)**	6
5	1183.619	4.30	-1.90	3.59	**C_{ort}**	6.2
6	1435.386	5.22	-0.98	0.96	**S**	10.68
8	2003.642	7.29	1.09	1.18	**B_1**	$2.75x10^2$
10	2,555.314	9.29	3.09	9.57	**p**	1
$\bar{C}$=6.2			**S_{xx}**	7.5	**n**	5
					$u(C_0)$	0.018

Table 0.138. Calculation of uncertainty of calibration curve for Heptachlor in mixture II of mix A on August 2023

20.08.2023 / 21.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	4.2
2	91.343	1.83	-3.17	10.07	**C_0 (ppm)**	4
3	144.834	2.90	-2.10	4.43	**C_{ort}**	5
4	192.44	3.85	-1.15	1.33	**S**	1.77
6	294.606	5.89	0.89	0.79	**B_1**	$5.00x10^1$
10	492.356	9.85	4.85	23.48	**p**	1
$\bar{C}$=5			**S_{xx}**	4.2	**n**	5
					$u(C_0)$	0.023

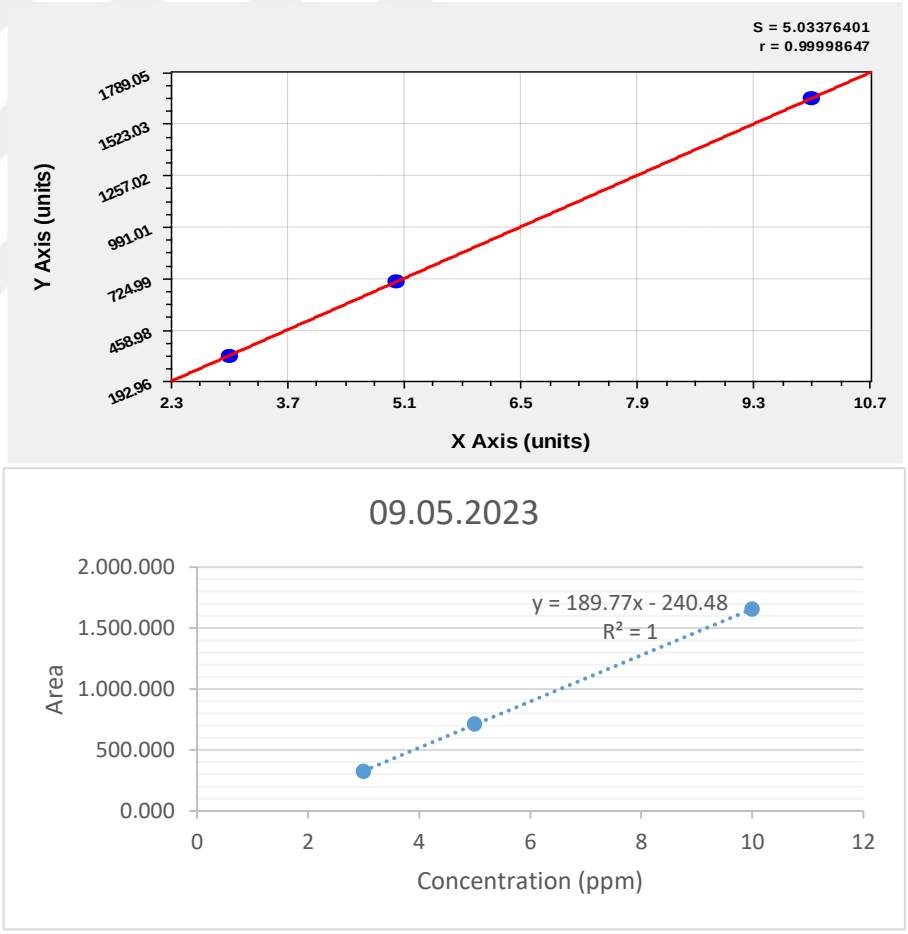
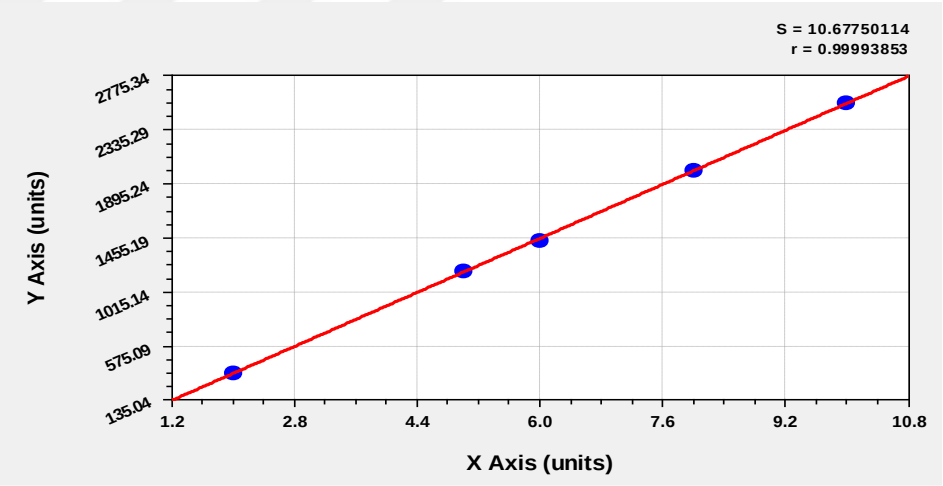


Figure 0.45. Calibration curves of Heptachlor in mixture II of mix A on May 2023



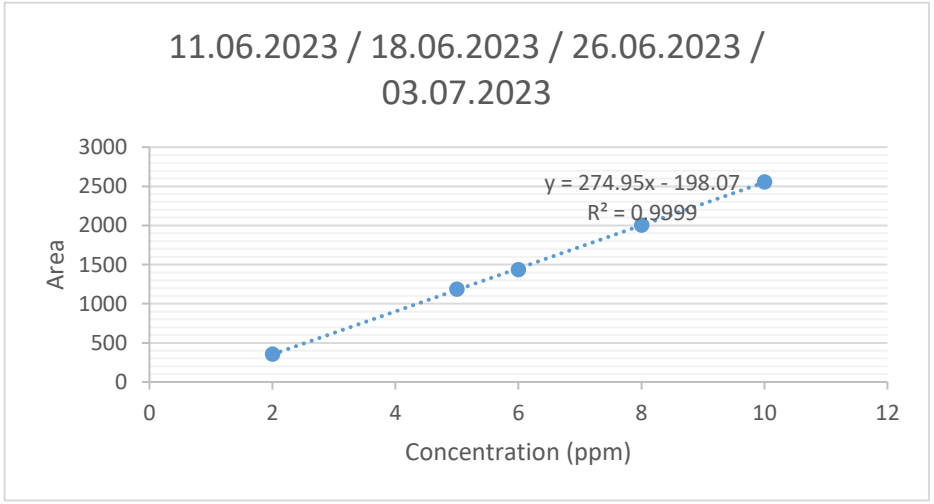
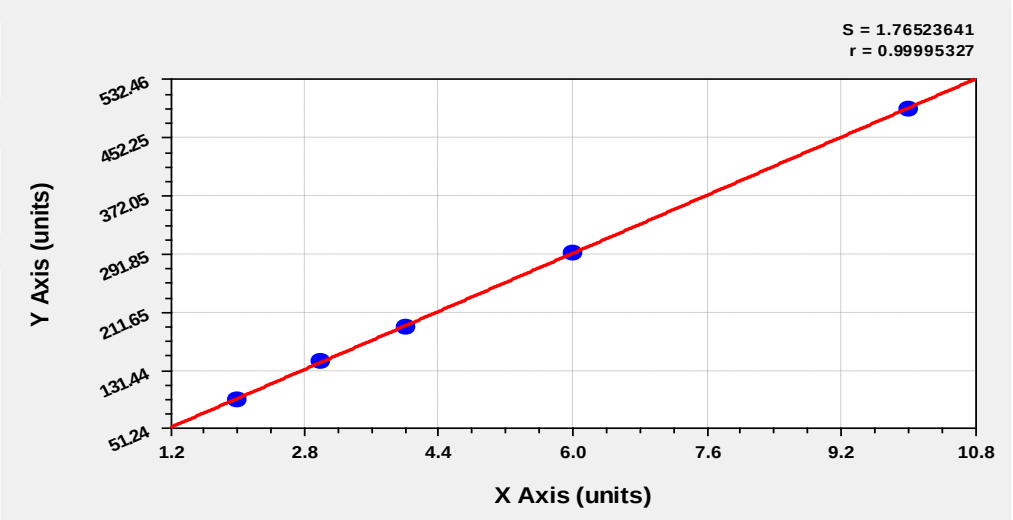


Figure 0.46. Calibration curves of Heptachlor in mixture II of mix A on June and July 2023



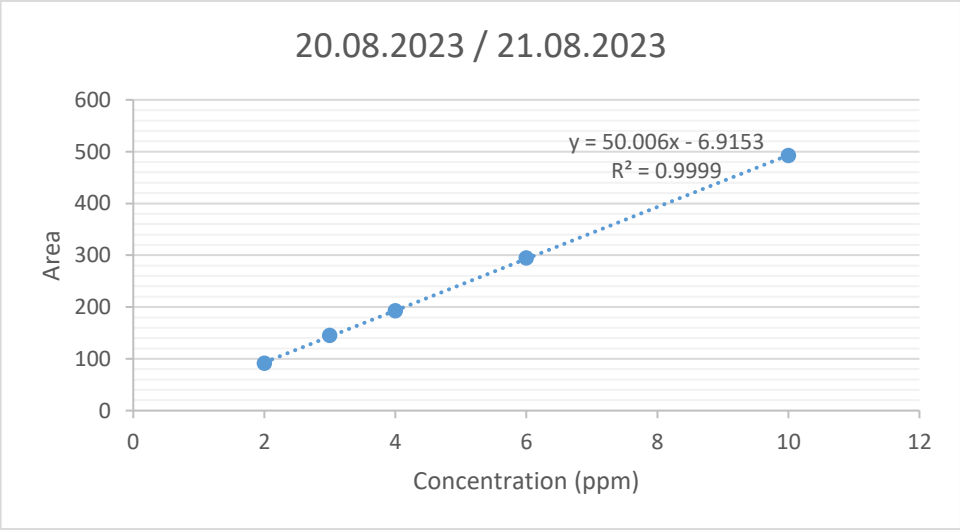


Figure 0.47. Calibration curves of Heptachlor in mixture II of mix A on August 2023

Table 0.139. Names of method for Heptachlor-*endo*-epoxide in mixture II of mix A

heptachlor-*endo*-epoxide in mixture II	
Date	**Method**
9.05.2023	pestisitcalibration
11.06.2023	pestisitcal
19.06.2023	pestisitcal
26.06.2023	pestisitcal
3.07.2023	pestisitcal
28.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.140. Calculation of uncertainty of calibration curve for Heptachlor-*endo*-epoxide in mixture II of mix A on May, June and July 2023

09.05.2023 / 11.06.2023 / 19.06.2023 / 26.06.2023 / 03.07 2023						
Conc (ppm)	**Area**	C_i	$C_i - C_{ort}$	$(C_i - C_{av})^2$	S_{xx}	7
2	106.680	1.75	-4.45	19.81	**C_0 (ppm)**	6
5	293.979	4.82	-1.38	1.91	**C_{ort}**	6.2
6	349.525	5.73	-0.47	0.22	**S**	2.56
8	475.283	7.79	1.59	2.53	**B_1**	$6.10x10^1$
$\bar{C}$=6.2			S_{xx}	7	**p**	1
					n	5
					$u(C_0)$	0.019

Table 0.141. Calculation of uncertainty of calibration curve for Heptachlor-*endo*-epoxide in mixture II of mix A on August 2023

28.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	46.2
3	84.955	1.82	-6.80	46.24	**C_0 (ppm)**	6
6	224.791	4.83	-6.80	46.24	**C_{ort}**	6.8
7	271.183	5.82	-6.80	46.24	**S**	0.191
$\bar{C}$=6.8			**S_{xx}**	46.2	**B_1**	$4.66x10^1$
					p	1
					n	3
					$u(C_0)$	0.002

Table 0.142. Calculation of uncertainty of calibration curve for Heptachlor-*endo*-epoxide in mixture II of mix A on October 2023

21.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	6.1
2	57.611	1.76	-4.44	19.68	**C_0 (ppm)**	6
5	154.436	4.73	-1.47	2.16	**C_{ort}**	6.2
6	186.778	5.72	-0.48	0.23	**S**	1.23
8	251.482	7.70	1.50	2.25	**B_1**	3.27x101
10	319.394	9.78	3.58	12.82	**p**	1
$\bar{C}$=6.2			**S_{xx}**	6.1	**n**	5
					$u(C_0)$	0.017

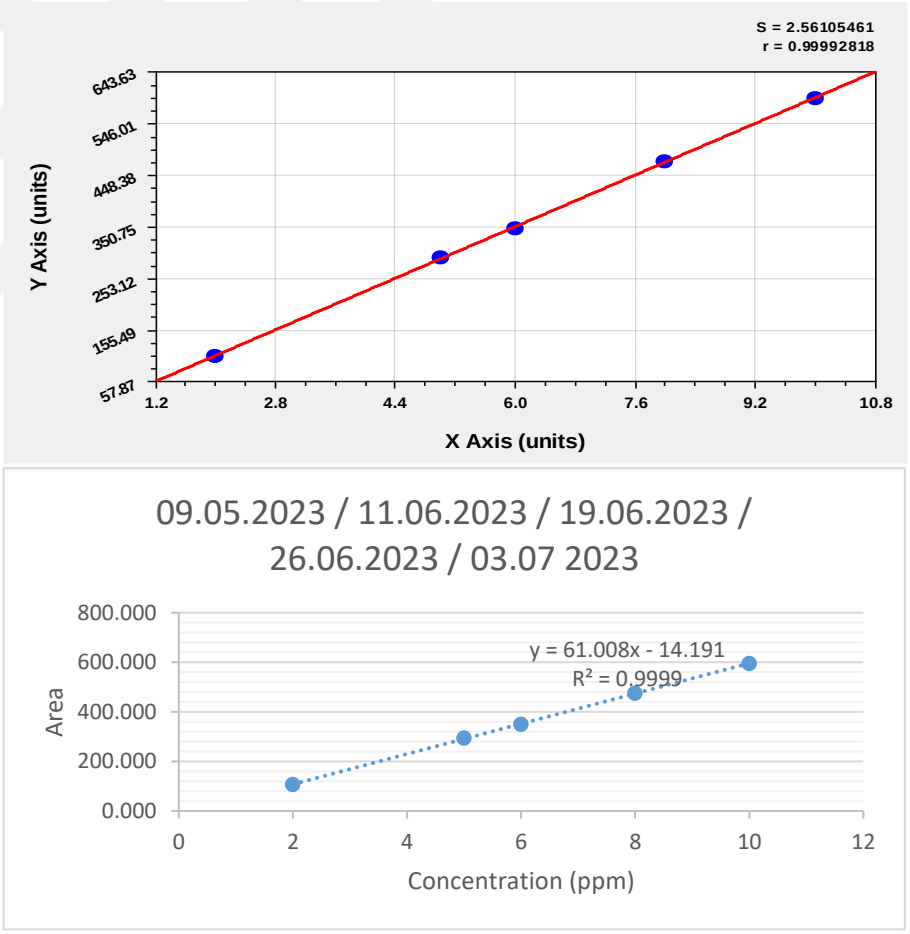
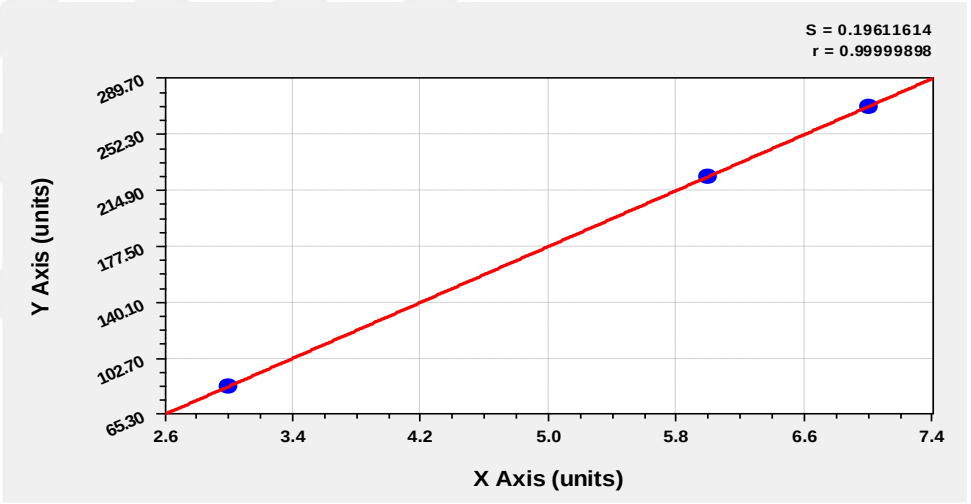


Figure 0.48. Calibration curves of Heptachlor-*endo*-epoxide in mixture II of mix A on May, June and July 2023



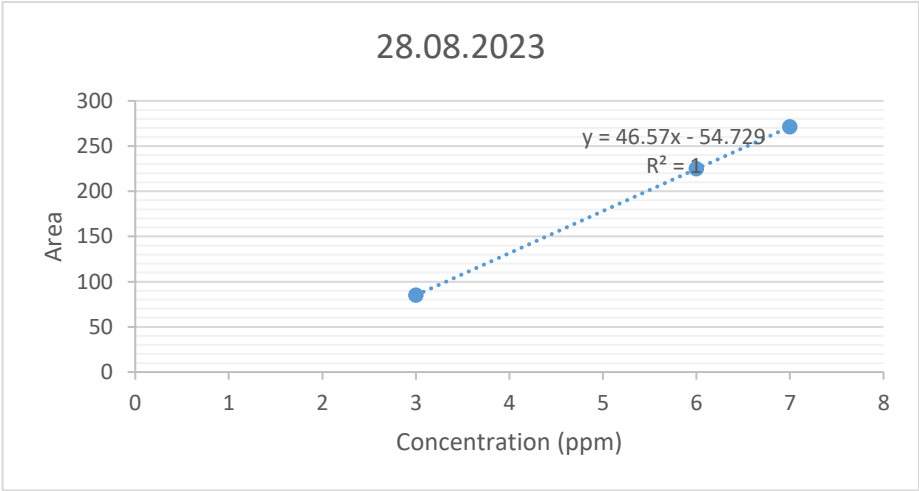


Figure 0.49. Calibration curves of Heptachlor-*endo*-epoxide in mixture II of mix A on August 2023

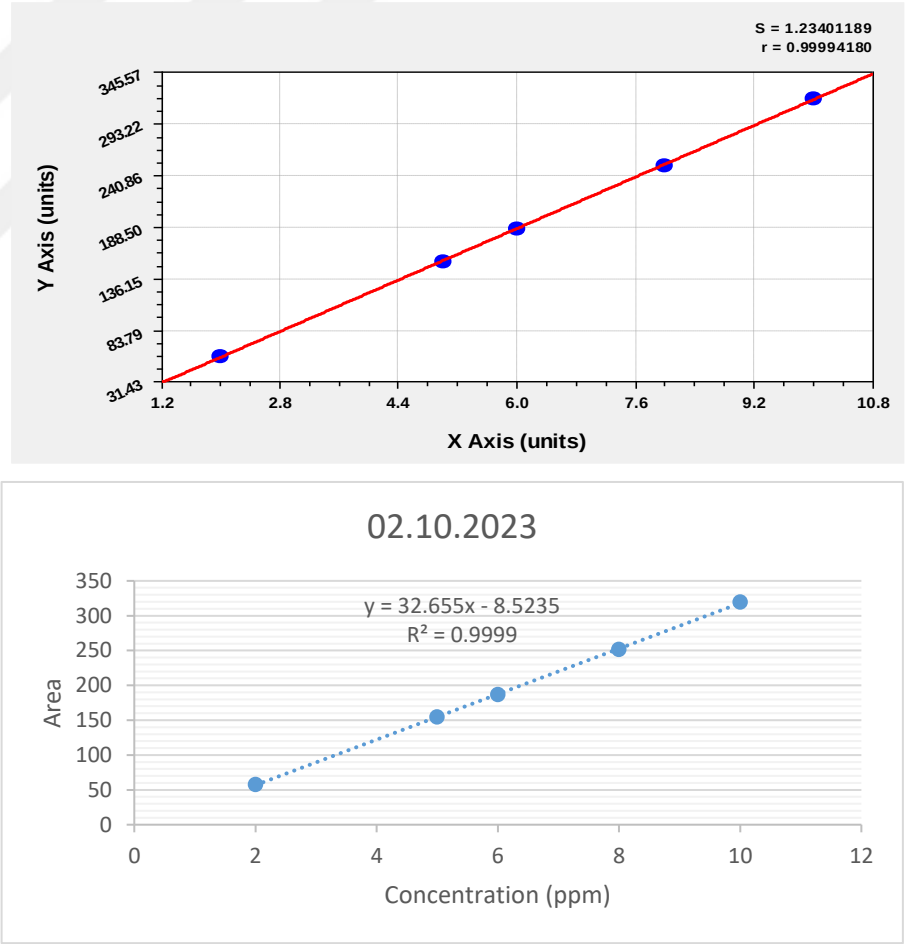


Figure 0.50. Calibration curves of Heptachlor-*endo*-epoxide in mixture II of mix A on October 2023

Table 0.143. Names of method for HCB in mixture I of mix B

HCB in mixture I	
Date	**Method**
9.05.2023	pestisitcalibration
10.06.2023	pestisitcal
19.06.2023	pestisitcal
25.06.2023	pestisitcal
3.07.2023	pestisitcal

Table 0.144. Calculation of uncertainty of calibration curve for HCB in mixture I of mix B on May 2023

9.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	11
2	558.814	1.64	-4.11	16.86	**C0 (ppm)**	8
3	895.592	2.63	-3.12	9.71	**Cort**	5.8
8	2,587.421	7.61	1.86	3.46	**S**	7.78
10	3,282.569	9.66	3.91	15.25	**B1**	339.98
$\overline{C}$=5.8			**S_{xx}**	11	**p**	1
					n	4
					$u(C_0)$	0.019

Table 0.145. Calculation of uncertainty of calibration curve for HCB in mixture I of mix B on June 2023

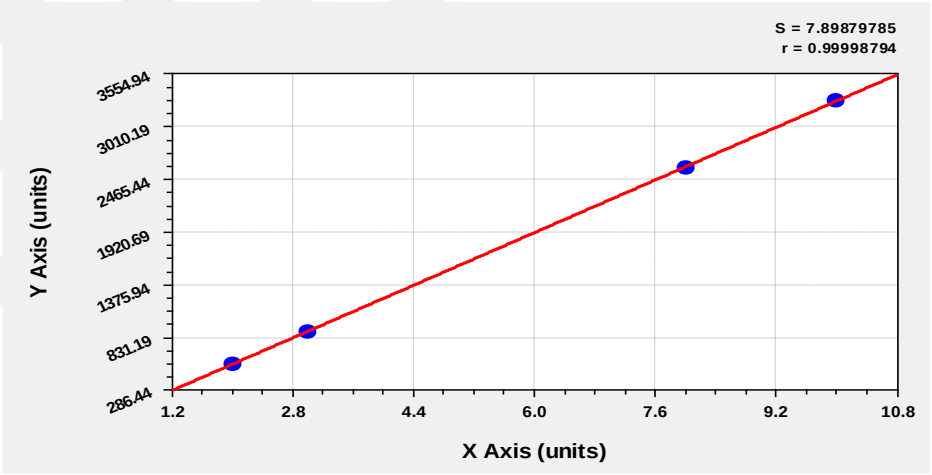
10.06.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	7
2	792.774	1.81	-4.39	19.30	**C_0 (ppm)**	6
5	2122.681	4.84	-1.36	1.86	**C_{ort}**	6.2
6	2543.646	5.80	-0.40	0.16	**S**	13.987
8	3447.014	7.85	1.65	2.74	**B_1**	438.86
10	4,297.602	9.79	3.59	12.91	**p**	1
$\bar{C}$=6.2			**S_{xx}**	7	**n**	5
					$u(C_0)$	0.014

Table 0.146. Calculation of uncertainty of calibration curve for HCB in mixture I of mix B on June 2023

19.06.2023 / 25.06.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	8
2	153.531	1.80	-3.40	11.58	**C_0 (ppm)**	5
3	239.776	2.81	-2.39	5.72	**C_{ort}**	5.2
5	412.685	4.83	-0.37	0.14	**S**	1.48
6	494.16	5.79	0.59	0.34	**B_1**	$8.54x10^1$
10	837.473	9.81	4.61	21.21	**p**	1
$\bar{C}$=5.2			**S_{xx}**	7	**n**	5
					$u(C_0)$	0.008

Table 0.147. Calculation of uncertainty of calibration curve for HCB in mixture I of mix B on July 2023

3.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	9
2	207.445	1.77	-4.73	22.36	**C_0 (ppm)**	6
6	666.708	5.69	-0.81	0.65	**C_{ort}**	6.5
8	906.797	7.74	1.24	1.54	**S**	5.50
10	1144.764	9.77	3.27	10.71	**B_1**	$1.17x10^2$
$\bar{C}$=6			**S_{xx}**	9	**p**	1
					n	4
					$u(C_0)$	0.025



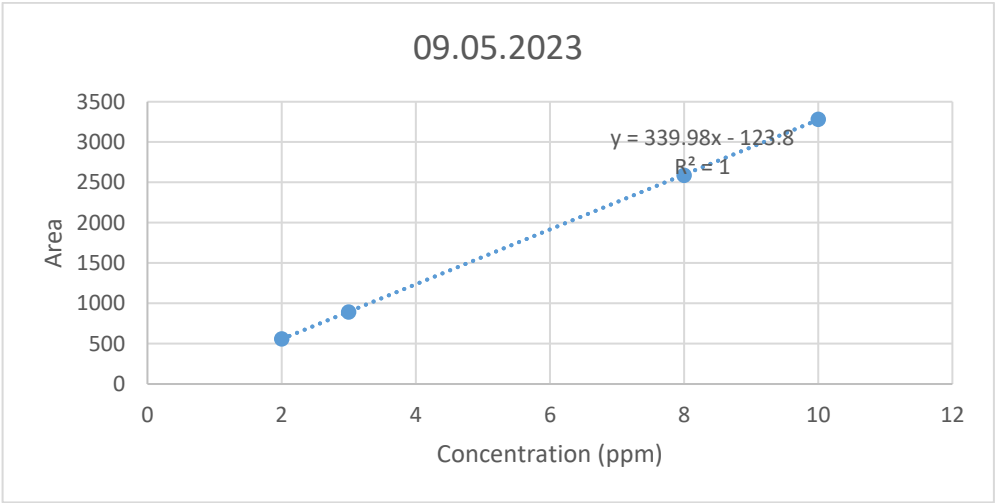


Figure 0.51. Calibration curves of HCB in mixture I of mix B on May 2023

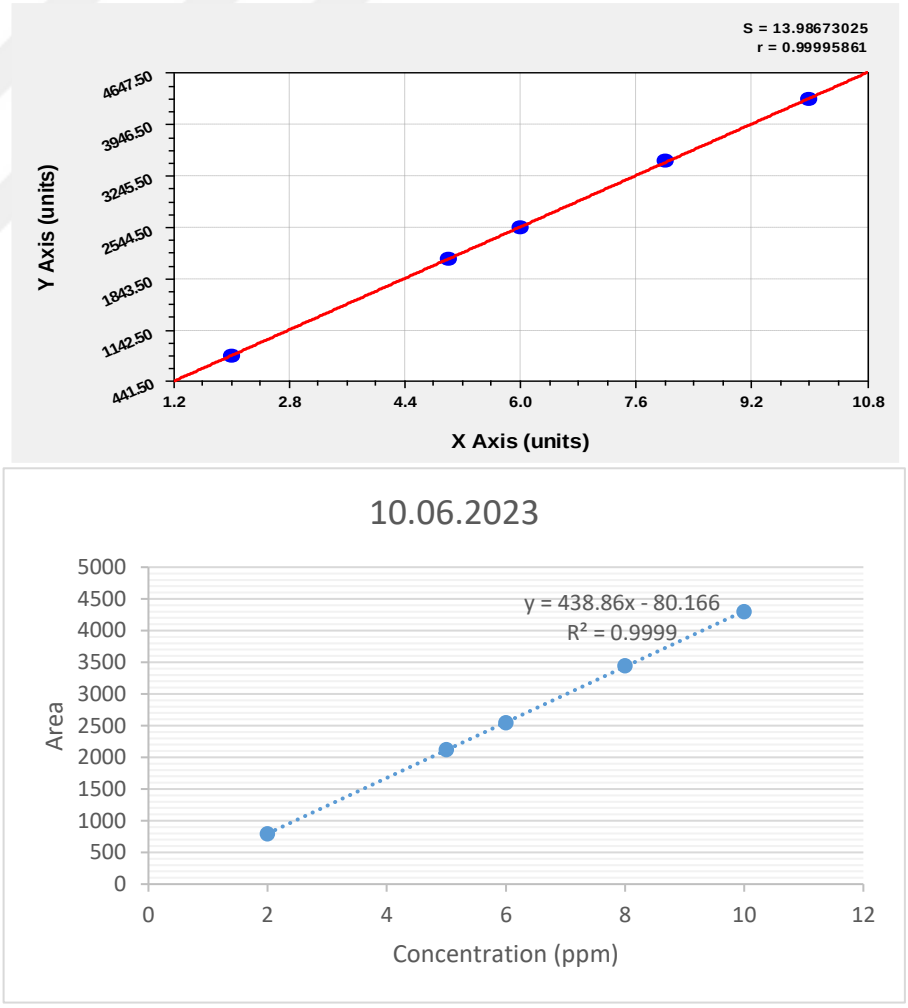


Figure 0.52. Calibration curves of HCB in mixture I of mix B on June 2023

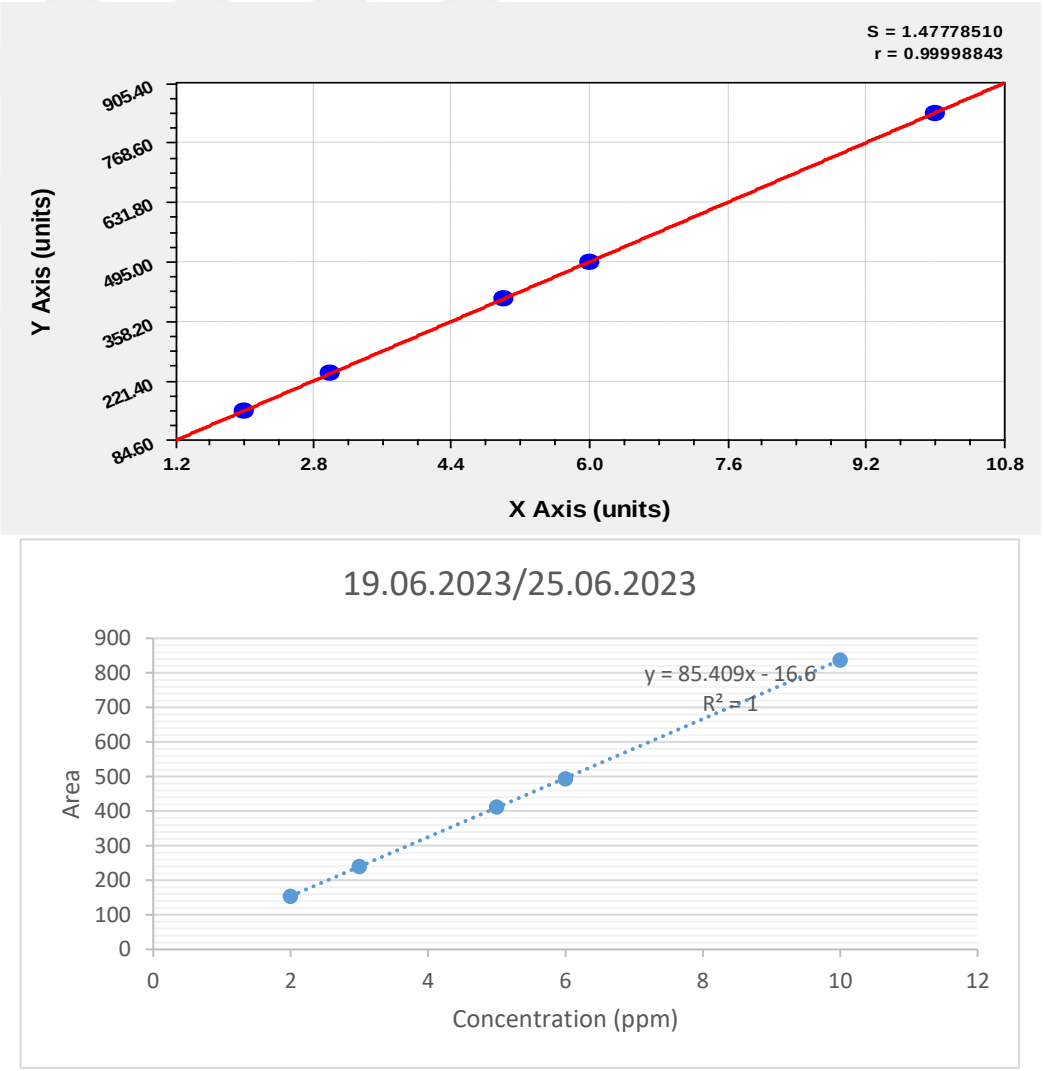
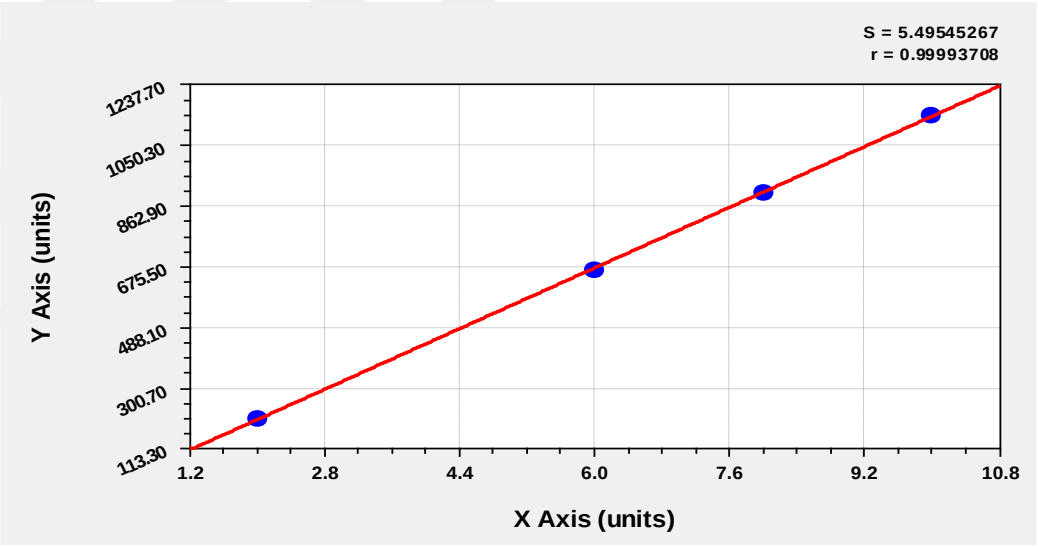


Figure 0.53. Calibration curves of HCB in mixture I of mix B on June 2023



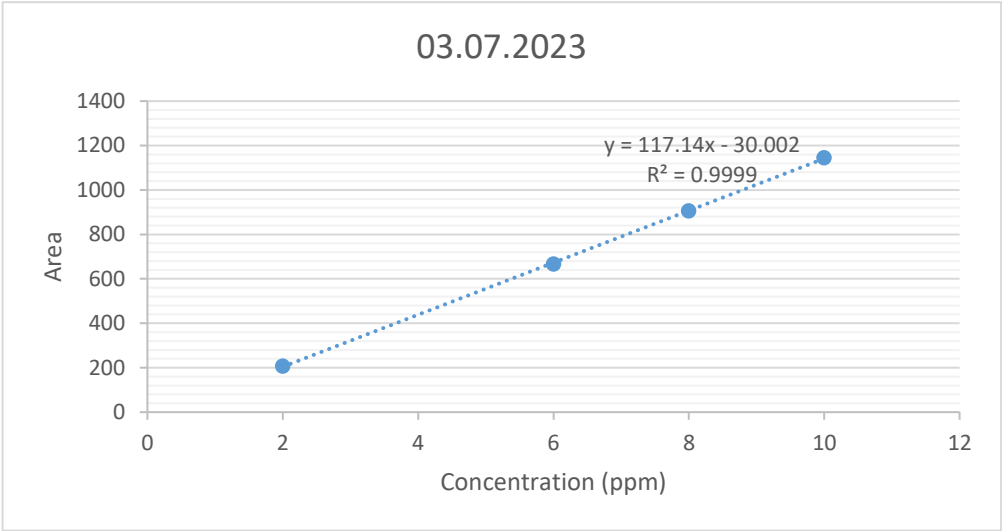


Figure 0.54. Calibration curves of HCB in mixture I of mix B on July 2023

Table 0.148. Names of method for Metolachlor in mixture I of mix B

metolachlor in mixture I	
Date	**Method**
11.06.2023	pestisitcal
19.06.2023	pestisitcal
26.06.2023	pestisitcal
3.07.2023	pestisitcal
20.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.149. Calculation of uncertainty of calibration curve for Metolachlor in mixture I of mix B on June 2023

11.06.2023 / 19.06.2023 / 26.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10
2	1,118.791	1.43	-4.82	23.22	**C_0 (ppm)**	5
5	3,469.473	4.44	-1.81	3.28	**C_{ort}**	6.3
8	5,804.951	7.43	1.18	1.39	**S**	4.98
10	7,373.132	9.44	3.19	10.15	**B_1**	$7.81x10^2$
$\bar{C}$=6.3			**S_{xx}**	10	**p**	1
					n	4
					$u(C_0)$	0.004

Table 0.150. Calculation of uncertainty of calibration curve for Metolachlor in mixture I of mix B on August 2023

20.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	8
2	285.152	1.41	-3.59	12.86	**C_0 (ppm)**	4
3	496.435	2.46	-2.54	6.44	**C_{ort}**	5
4	712.779	3.53	-1.47	2.15	**S**	10.1
6	1102.154	5.47	0.47	0.22	**B_1**	$2.02x10^2$
10	1,904.959	9.45	4.45	19.77	**p**	1
$\bar{C}$=5			**S_{xx}**	8	**n**	5
					$u(C_0)$	0.028

Table 0.151. Calculation of uncertainty of calibration curve for Metolachlor in mixture I of mix B on October 2023

2.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10
2	44.481	0.95	-5.30	28.09	**C_0 (ppm)**	8
5	180.87	3.86	-2.39	5.70	**C_{ort}**	6.2
8	325.468	6.95	0.70	0.49	**S**	2.370
10	417.687	8.92	2.67	7.13	**B_1**	$4.68x10^1$
$\bar{C}$=6.2			**S_{xx}**	10	**p**	1
					n	4
					$u(C_0)$	**0.038**

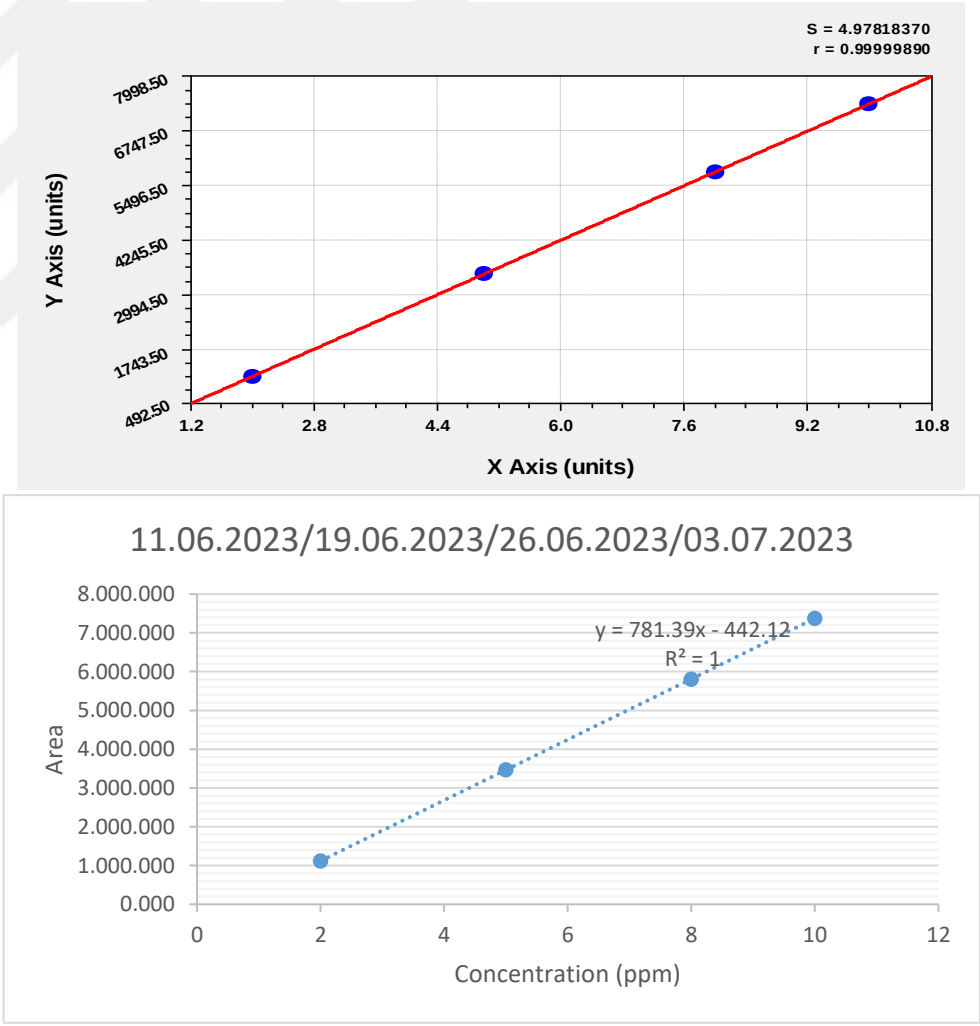


Figure 0.55. Calibration curves of Metolachlor in mixture I of mix B on June and July 2023

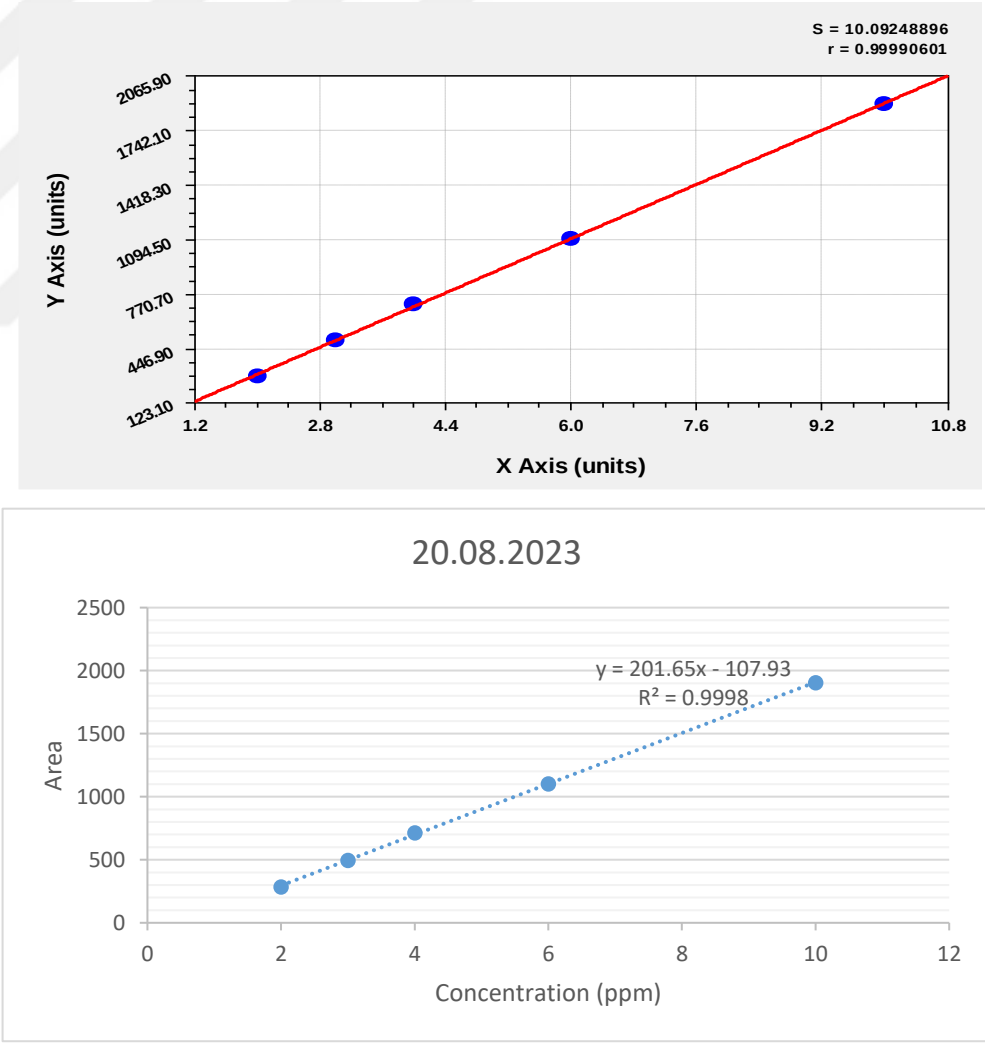
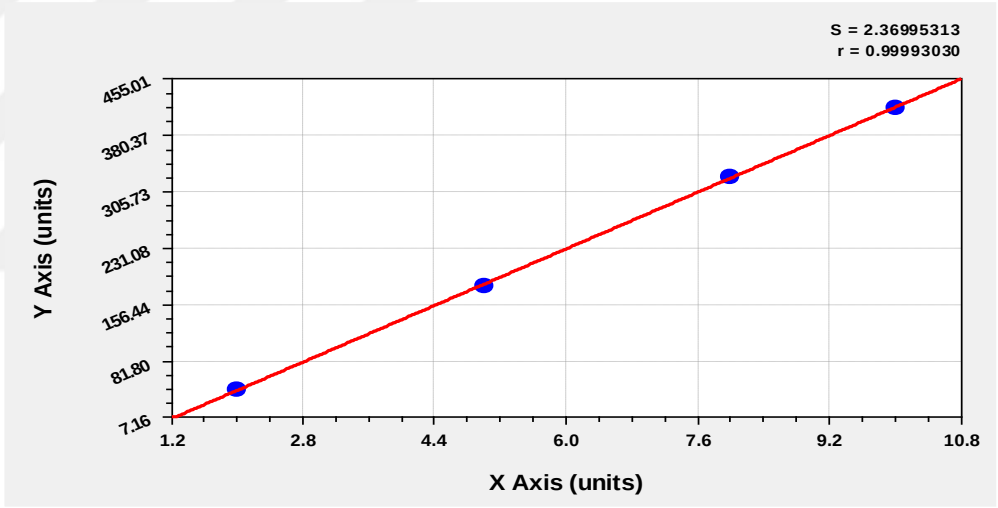


Figure 0.56. Calibration curves of Metolachlor in mixture I of mix B on August 2023



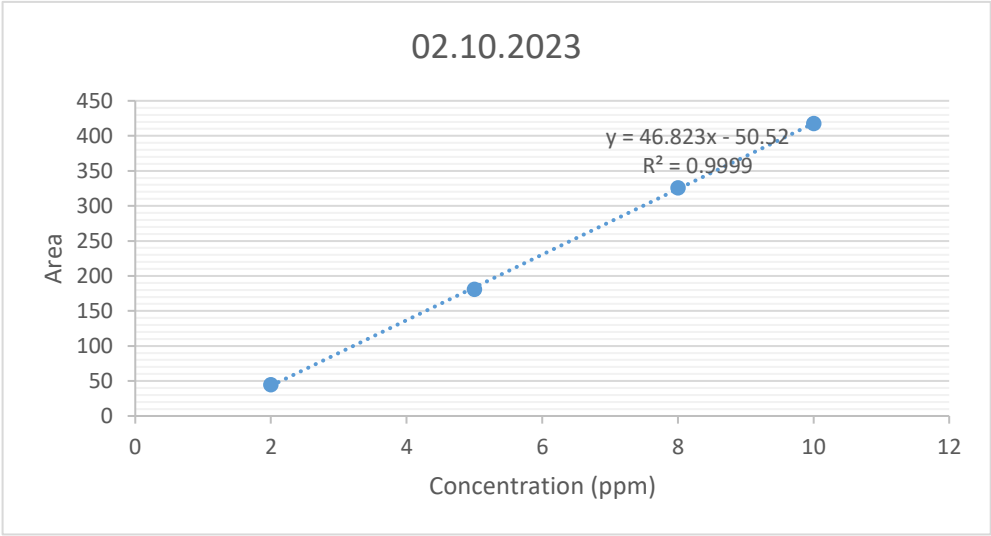


Figure 0.57. Calibration curves of Metolachlor in mixture I of mix B on October 2023

Table 0.152. Names of method for *alpha*-HCH in mixture II of mix B

***alpha*-HCH in mixture II**	
Date	**Method**
9.05.2023	pestisitcalibration
11.06.2023	pestisitcal
18.06.2023	pestisitcal
25.06.2023	pestisitcal
3.07.2023	pestisitcal
21.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.153. Calculation of uncertainty of calibration curve for *alpha*-HCH in mixture II of mix B on May 2023

9.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	11,4
2	347.311	1.53	-4.22	17.79	**C0 (ppm)**	8
3	588.997	2.60	-3.15	9.93	**Cort**	5.8
8	1,711.346	7.55	1.80	3.24	**S**	8
10	2,168.546	9.57	3.82	14.56	**B1**	$2.27x10^2$
$\bar{C}$=5.8			**S_{xx}**	11.4	**p**	1
					n	4
					$u(C_0)$	0.029

Table 0.154. Calculation of uncertainty of calibration curve for *alpha*-HCH in mixture II of mix B on June and July 2023

11.06.2023/25.06.2023/03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	7.9
2	236.754	1.64	-4.56	20.82	**C_0 (ppm)**	6
5	665.818	4.60	-1.60	2.55	**C_{ort}**	6
6	805.153	5.57	-0.63	0.40	**S**	4.60
8	1.103.111	7.63	1.43	2.04	**B_1**	$1.45x10^2$
10	1.392.270	9.63	3.43	11.74	**p**	1
$\bar{C}$=6			**S_{xx}**	7.9	**n**	5
					$u(C_0)$	0.014

Table 0.155. Calculation of uncertainty of calibration curve for *alpha*-HCH in mixture II of mix B on June 2023

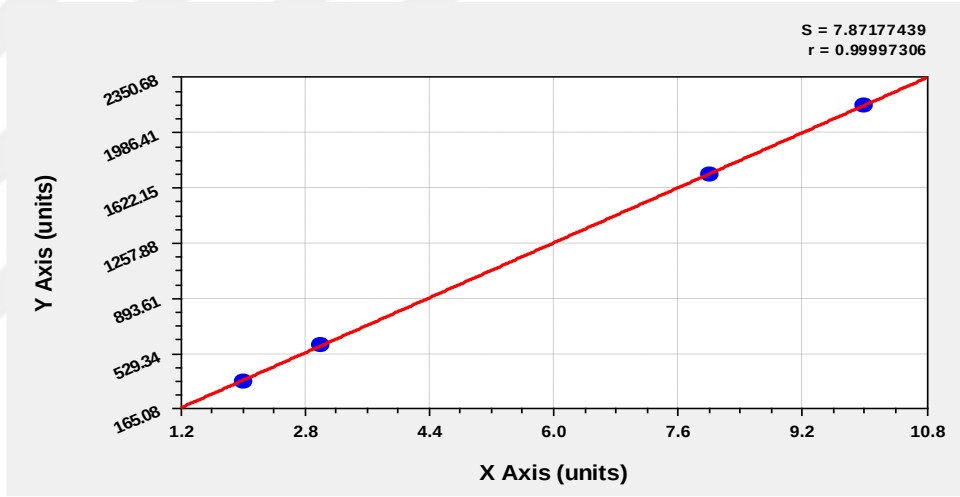
18.06.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	7.4
2	447.248	1.85	-4.35	18.94	**C_0 (ppm)**	6
5	1171.193	4.84	-1.36	1.85	**C_{ort}**	6.2
6	1,405.675	5.81	-0.39	0.15	**S**	5.27
8	1,901.966	7.86	1.66	2.75	**B_1**	$2.42x10^2$
10	2,381.357	9.84	3.64	13.23	**p**	1
$\bar{C}$=6.2			**S_{xx}**	7.4	**n**	5
					$u(C_0)$	0.010

Table 0.156. Calculation of uncertainty of calibration curve for *alpha*-HCH in mixture II of mix B on August 2023

21.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	8
2	150.424	1.82	-4.18	17.51	**C_0 (ppm)**	6
4	314.746	3.80	-2.20	4.84	**C_{ort}**	6
6	478.368	5.77	-0.23	0.05	**S**	2.77
8	650.318	7.85	1.85	3.42	**B_1**	$8.28x10^1$
10	811.008	9.79	3.79	14.37	**p**	1
$\bar{C}$=6			**S_{xx}**	8	**n**	5
					$u(C_0)$	0.015

Table 0.157. Calculation of uncertainty of calibration curve for *alpha*-HCH in mixture II of mix B on October 2023

2.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	6.4
2	116.791	1.82	-4.18	17.48	**C_0 (ppm)**	6
4	246.558	3.84	-2.16	4.67	**C_{ort}**	6
6	375.619	5.85	-0.15	0.02	**S**	2.42
8	506.075	7.88	1.88	3.53	**B_1**	64.2
10	629.257	9.80	3.80	14.43	**p**	1
$\bar{C}$=6			**S_{xx}**	6.4	**n**	5
					$u(C_0)$	0.017



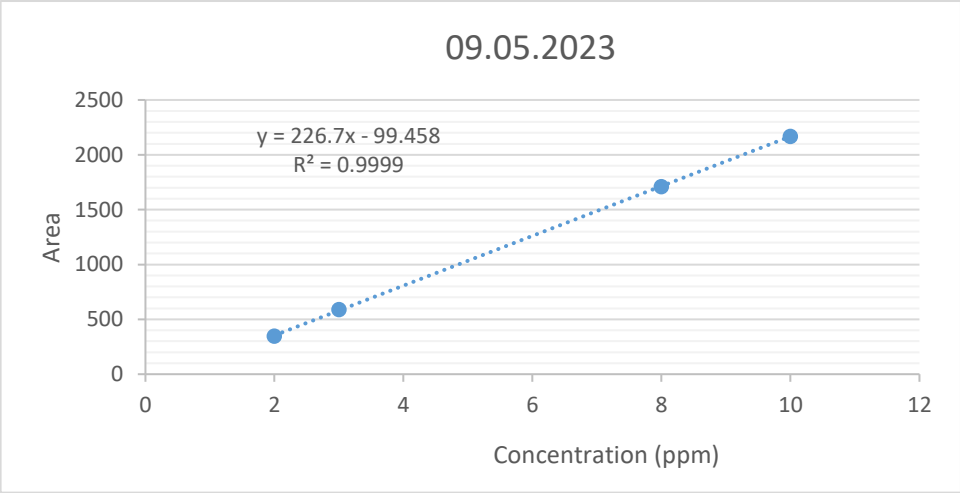
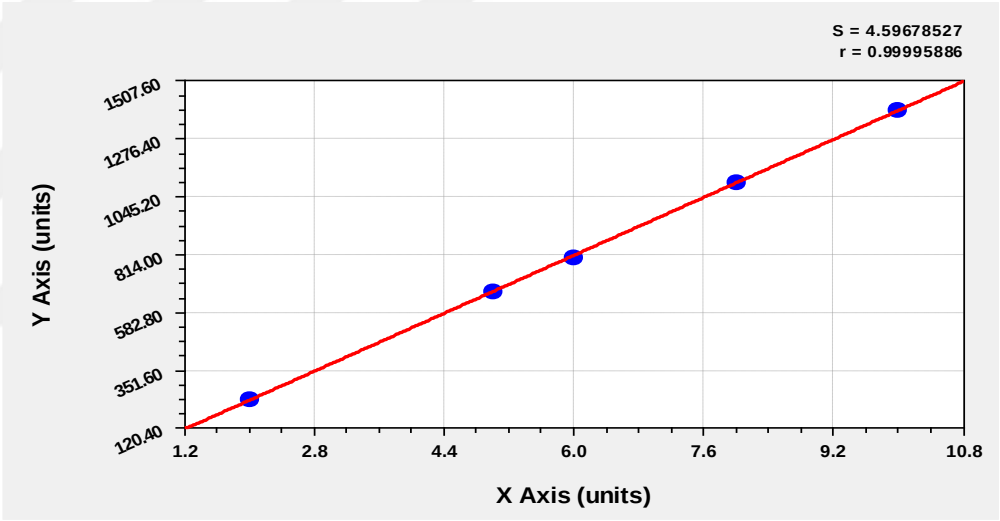


Figure 0.58. Calibration curves of *alpha*-HCH in mixture II of mix B on May 2023



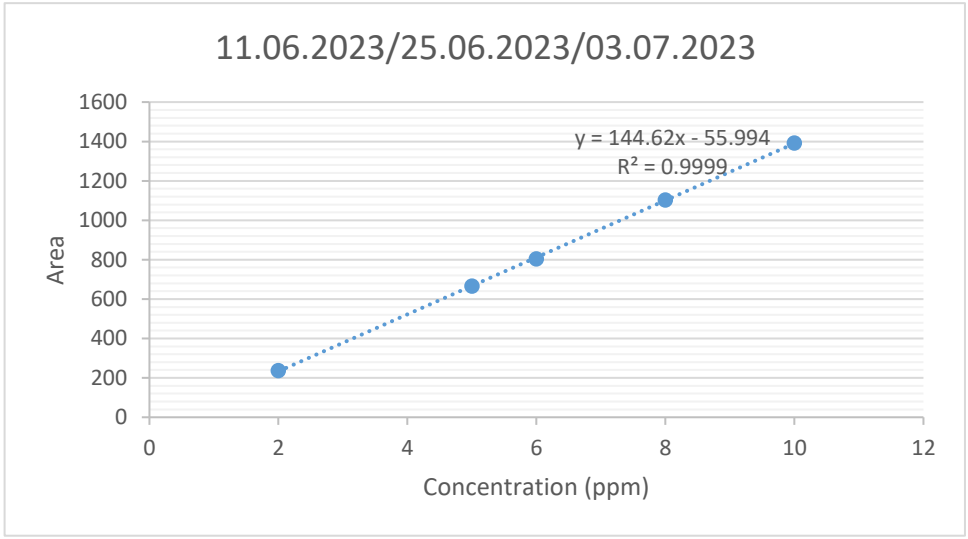
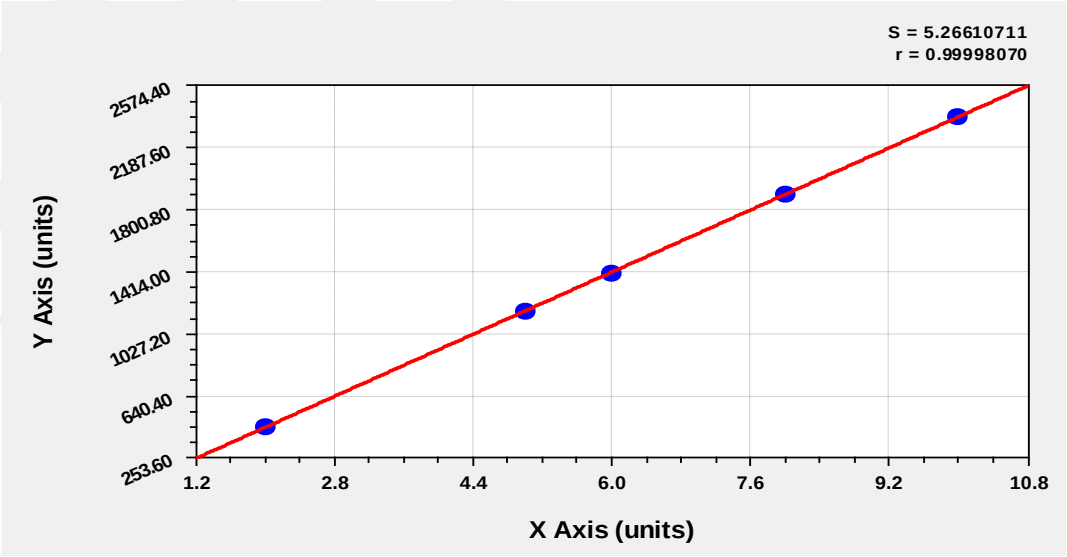


Figure 0.59. Calibration curves of *alpha*-HCH in mixture II of mix B on June and July 2023



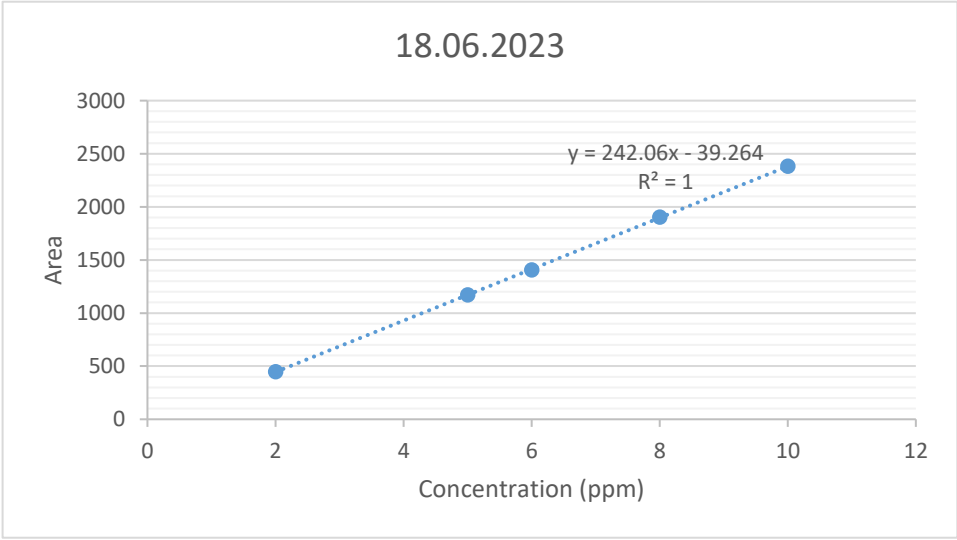


Figure 0.60. Calibration curves of *alpha*-HCH in mixture II of mix B on June 2023

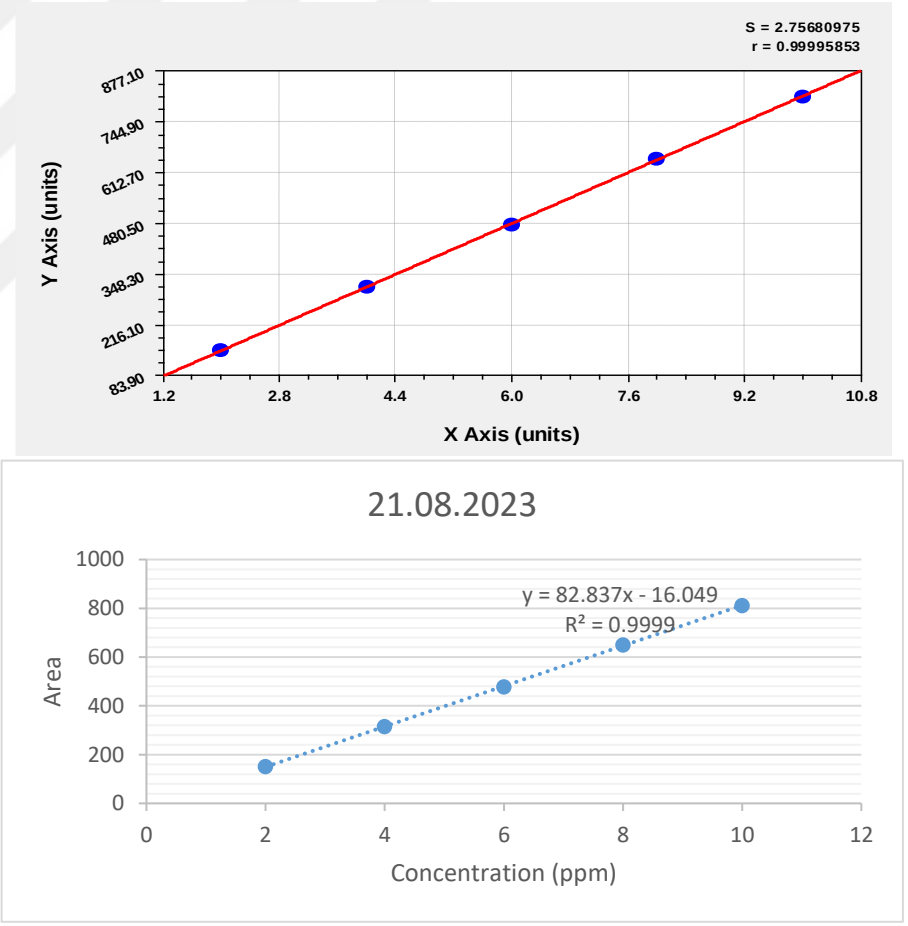
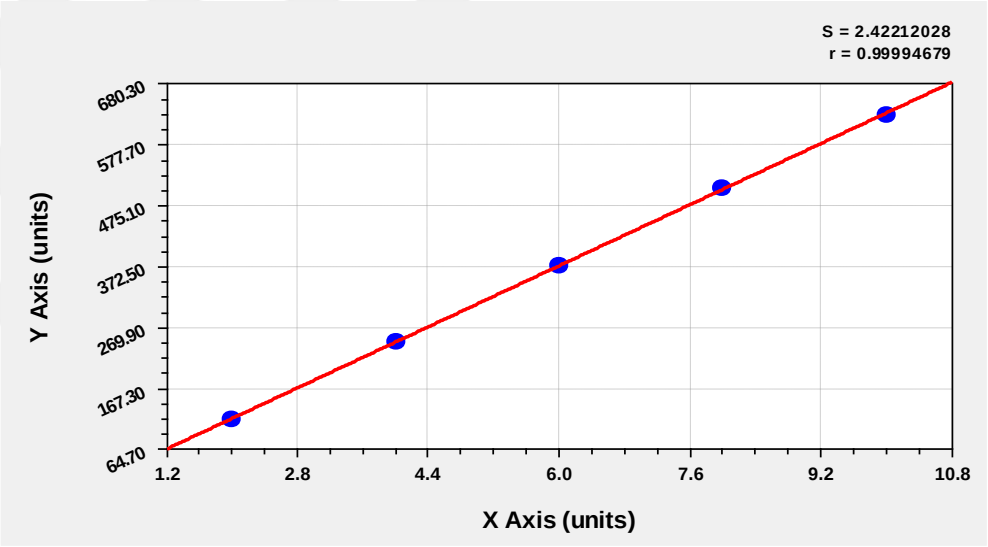


Figure 0.61. Calibration curves of *alpha*-HCH in mixture II of mix B on August 2023



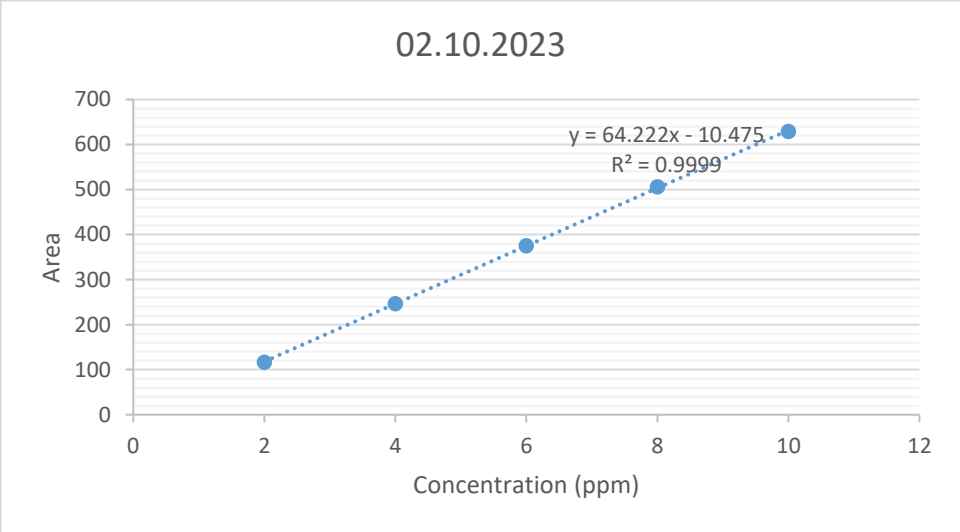


Figure 0.62. Calibration curves of *alpha*-HCH in mixture II of mix B on October 2023

Table 0.158. Names of method for *gamma*-HCH in mixture II of mix B

***gamma*-HCH in mixture II**	
Date	**Method**
9.05.2023	pestisitcalibration
10.06.2023	pestisitcal
18.06.2023	pestisitcal
25.06.2023	pestisitcal
3.07.2023	pestisitcal
20.08.2023	pestisitcal
2.10.2023	Pestisitcalmix102

Table 0.159. Calculation of uncertainty of calibration curve for *gamma*-HCH in mixture II of mix B on May, June and July 2023

9.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	14
2	288.924	1.86	-4.34	18.86	**C_0 (ppm)**	6
5	759.160	4.88	-1.32	1.74	**C_{ort}**	6.2
6	911.577	5.86	-0.34	0.12	**S**	7.529
8	1,228.312	0.00	-6.20	38.44	**B_1**	$1.56x10^2$
10	1,532.013	9.85	3.65	13.30	**p**	1
$\bar{C}$=6.2			**S_{xx}**	14	**n**	5
					$u(C_0)$	0.022

Table 0.160. Calculation of uncertainty of calibration curve for *gamma*-HCH in mixture II of mix B on June and July 2023

10.06.2023 / 18.06.2023 /25.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	7.4
2	288.924	1.86	-4.34	18.86	**C_0 (ppm)**	6
5	759.16	4.88	-1.32	1.74	**C_{ort}**	6.2
6	911.577	5.86	-0.34	0.12	**S**	3.543
8	1228.312	7.89	1.69	2.87	**B_1**	$1.56x10^2$
10	1,532.013	9.85	3.65	13.30	**p**	1
$\bar{C}$=6.2			**S_{xx}**	7.4	**n**	5
					$u(C_0)$	0.010

Table 0.161. Calculation of uncertainty of calibration curve for *gamma*-HCH in mixture II of mix A on August 2023

20.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	5.2
2	141.537	1.90	-2.35	5.53	**C_0 (ppm)**	4
3	212.963	2.86	-1.39	1.94	**C_{ort}**	5
4	287.229	3.85	-0.40	0.16	**S**	2.01
8	587.574	7.88	3.63	13.19	**B_1**	$7.46x10^1$
$\bar{C}$=5			**S_{xx}**	5.2	**p**	1
					n	4
					$u(C_0)$	0.018

Table 0.162. Calculation of uncertainty of calibration curve for gamma-HCH in mixture II of mix B on October 2023

02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	5.2
4	210.093	3.52	-3.48	12.12	**C_0 (ppm)**	6
6	327.854	5.49	-1.51	2.28	**C_{ort}**	7
8	448.532	7.51	0.51	0.26	**S**	1.18
10	567.978	9.51	2.51	6.31	**B_1**	59.717
$\bar{C}$=7			**S_{xx}**	5.2	**p**	1
					n	4
					$u(C_0)$	0.013

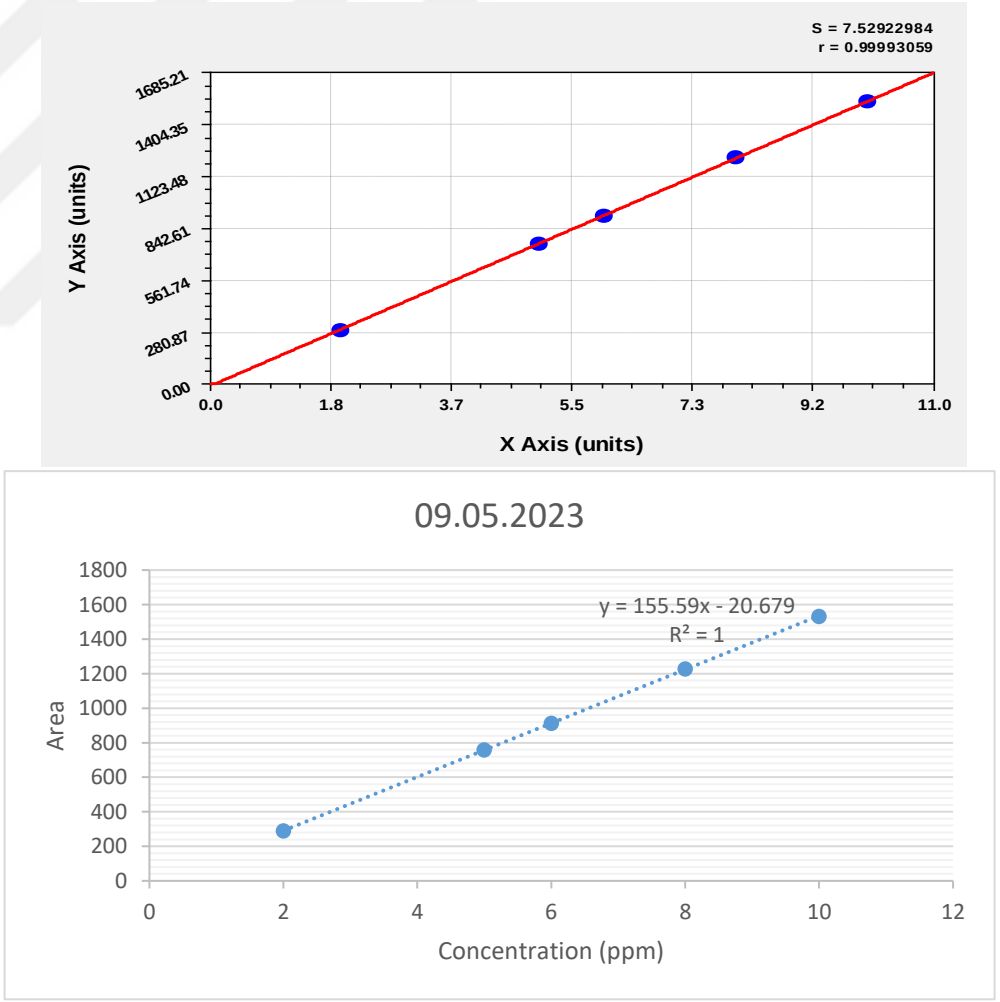


Figure 0.63. Calibration curves of *gamma*-HCH in mixture II of mix B on May 2023

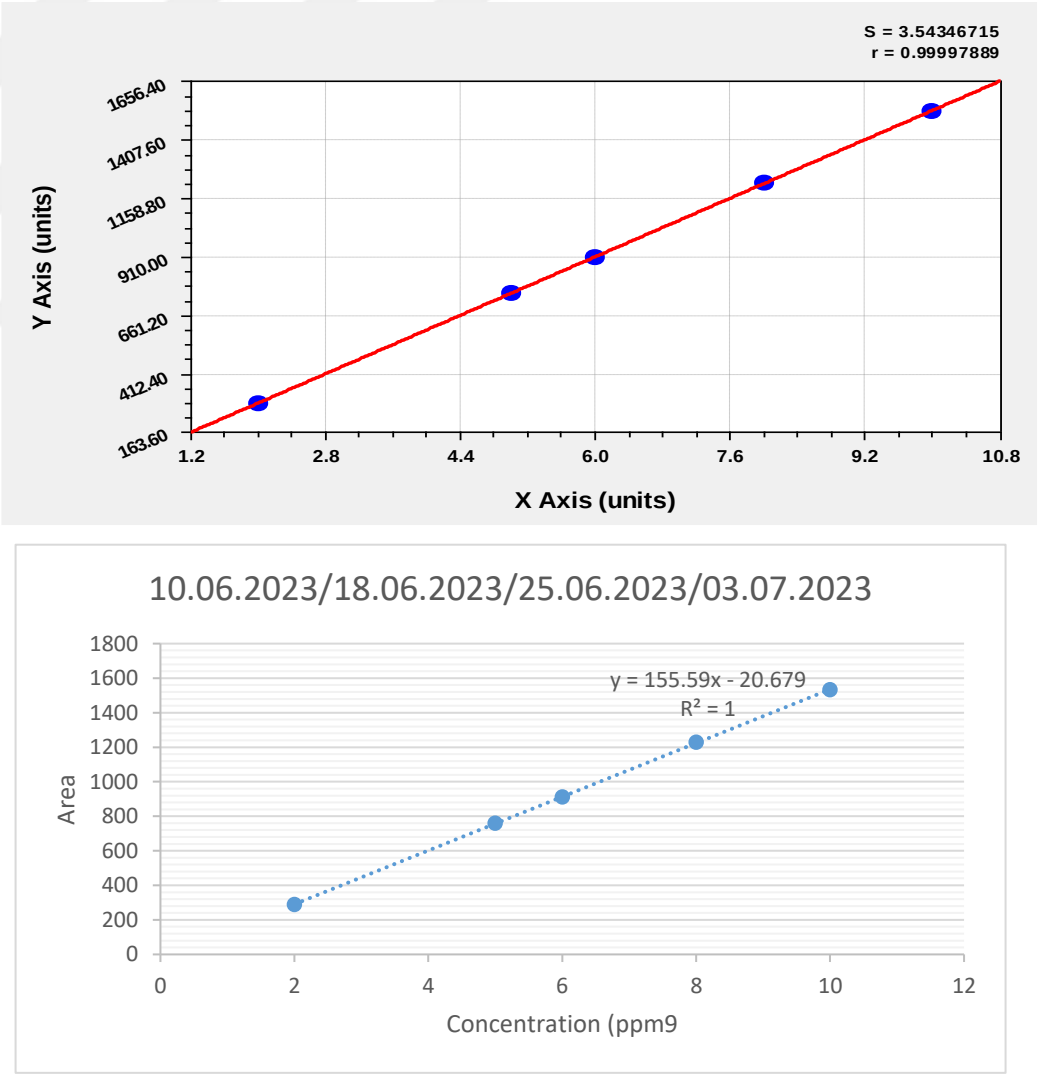
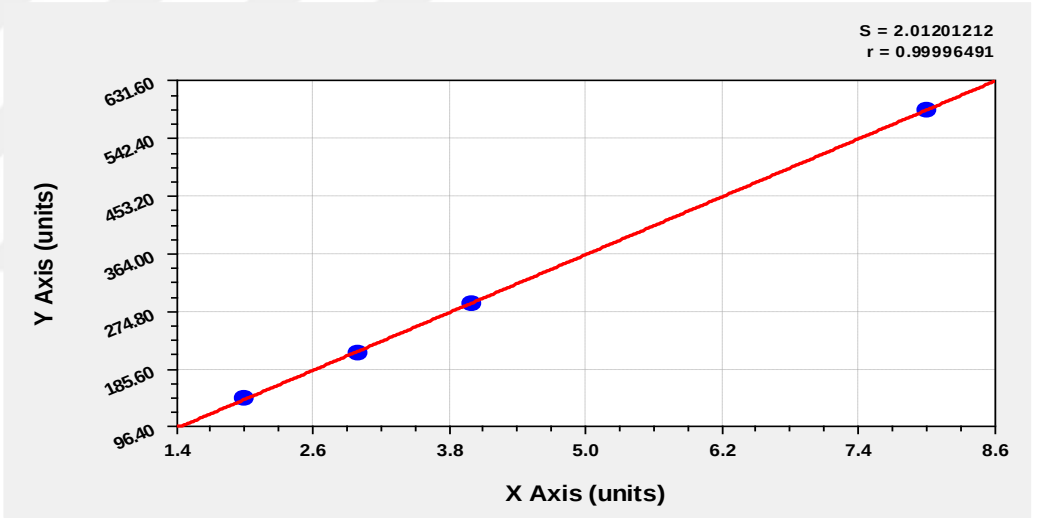


Figure 0.64. Calibration curves of *gamma*-HCH in mixture II of mix B on June and July 2023



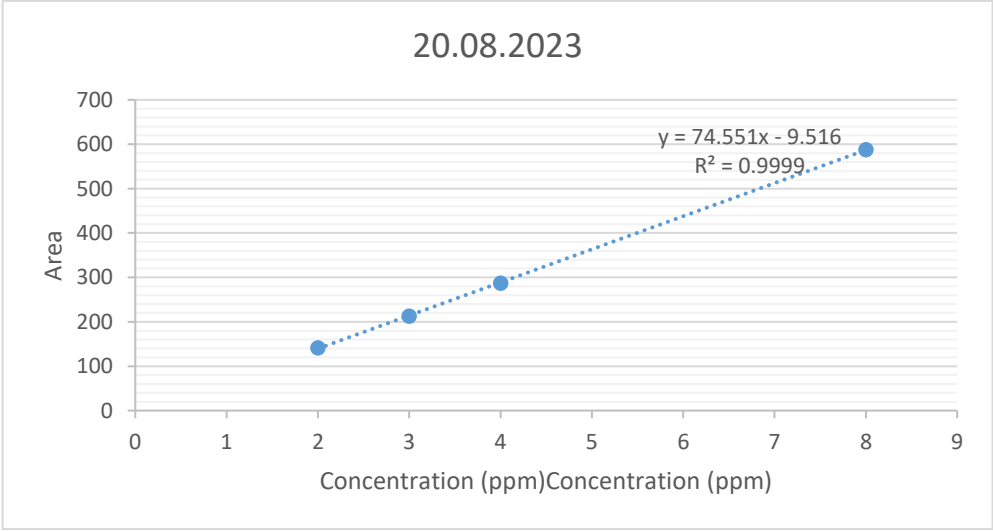
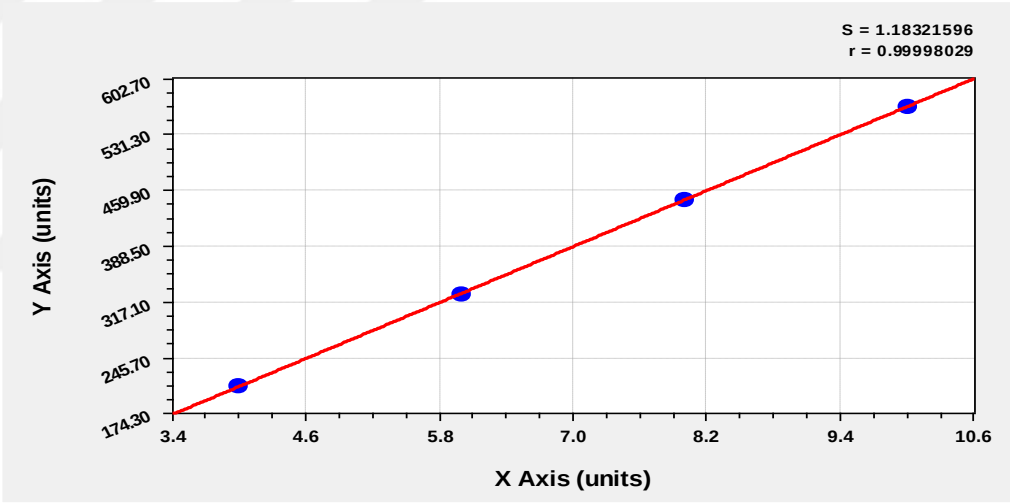


Figure 0.65. Calibration curves of *gamma*-HCH in mixture II of mix B on August 2023



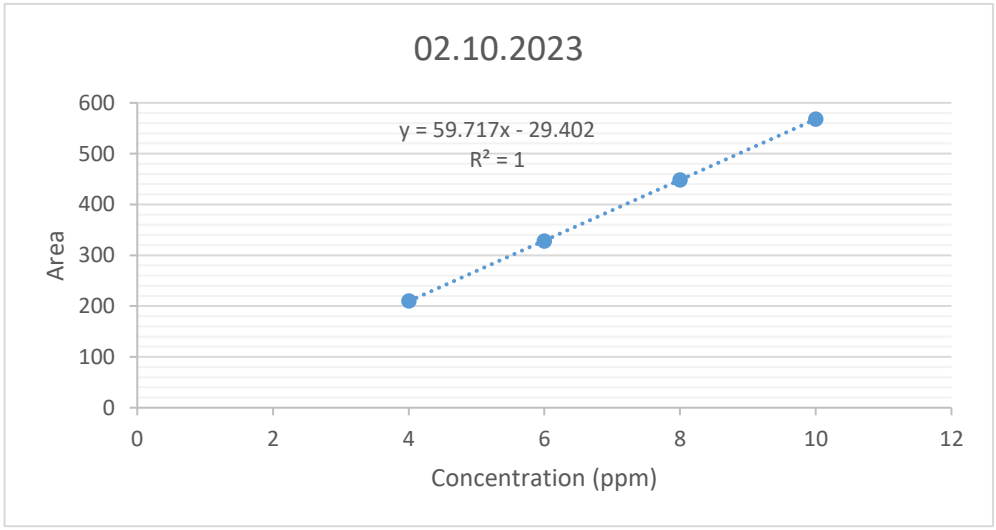


Figure 0.66. Calibration curves of *gamma*-HCH in mixture II of mix B on October 2023

Table 0.163. Names of method for Aldrin in mixture II of mix B

aldrin in mixture II	
Date	**Method**
9.05.2023	pestisitcalibration
11.06.2023	pestisitcal
18.06.2023	pestisitcal
26.06.2023	pestisitcal
3.07.2023	pestisitcal
20.08.2023	pestcal
2.10.2023	Pestisitcalmix102

Table 0.164. Calculation of uncertainty of calibration curve for Aldrin in mixture II of mix B on May 2023

9.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	11
2	431.086	1.57	-4.18	17.48	**C_0 (ppm)**	8
3	707.917	2.58	-3.17	10.07	**C_{ort}**	5.8
8	2,087.936	7.60	1.85	3.41	**S**	5.612
10	2,626.741	9.56	3.81	14.50	**B_1**	$2.75x10^2$
$\bar{C}$=5.8			**S_{xx}**	11	**p**	1
					n	4
					$u(C_0)$	0.017

Table 0.165. Calculation of uncertainty of calibration curve for Aldrin in mixture II of mix B on June and July 2023

11.06.2023 / 18.06.2023 / 26.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	8.8
2	183.054	1.71	-4.79	22.90	**C_0 (ppm)**	6
6	611.956	5.73	-0.77	0.59	**C_{ort}**	6.5
8	824.657	7.73	1.23	1.50	**S**	0,97
10	1,036.744	9.71	3.21	10.32	**B_1**	$1.07x10^2$
$\bar{C}$=6.5			**S_{xx}**	8.8	**p**	1
					n	4
					$u(C_0)$	0.005

Table 0.166. Calculation of uncertainty of calibration curve for Aldrin in mixture II of mix B on August 2023

20.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	4.7
3	320.09	2.96	-2.04	4.17	**C_0 (ppm)**	4
4	427.763	3.95	-1.05	1.09	**C_{ort}**	5.0
8	860.849	7.96	2.96	8.74	**S**	0.77
$\bar{C}$=5			**S_{xx}**	4.7	**B_1**	108.19
					p	1
					n	3
					$u(C_0)$	4.668

Table 0.167. Calculation of uncertainty of calibration curve for Aldrin in mixture II of mix B on October 2023

02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	5.0
4	210.179	4.19	-2.81	7.88	**C_0 (ppm)**	4
6	311.985	6.22	-0.78	0.60	**C_{ort}**	5
8	410.025	8.18	1.18	1.39	**S**	0.63
10	511.626	10.21	3.21	10.29	**B_1**	50.119
$\bar{C}$=5.0			**S_{xx}**	5.0	**p**	1
					n	7
					$u(C_0)$	0.007

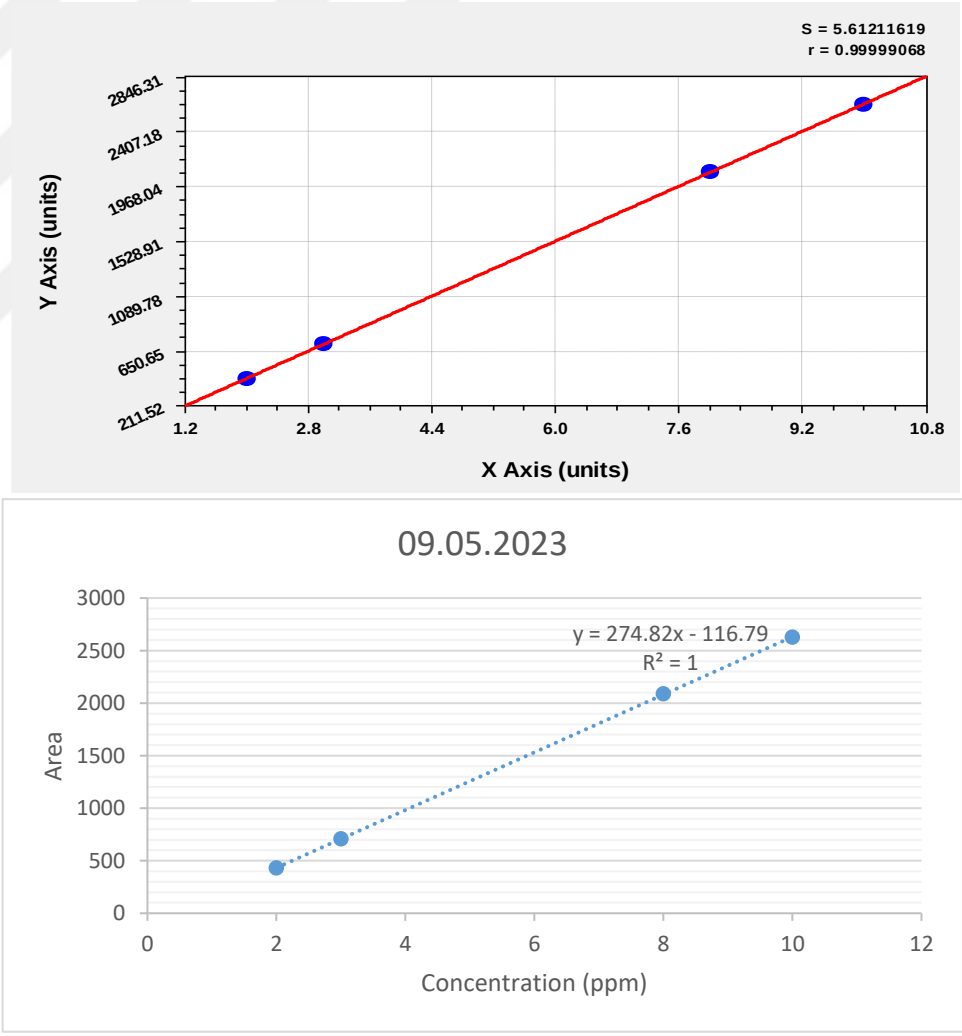


Figure 0.67. Calibration curves of Aldrin in mixture II of mix B on May 2023

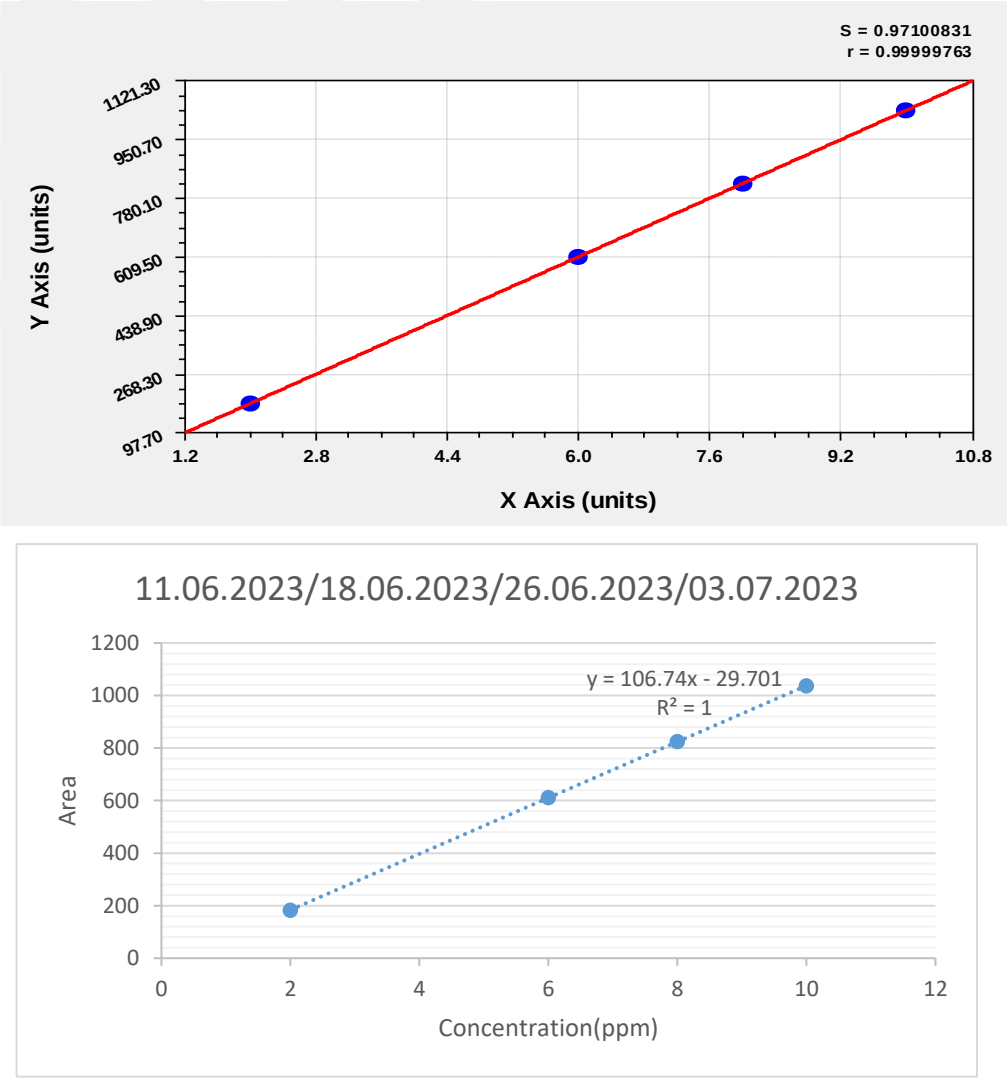


Figure 0.68. Calibration curves of Aldrin in mixture II of mix B on June and July 2023

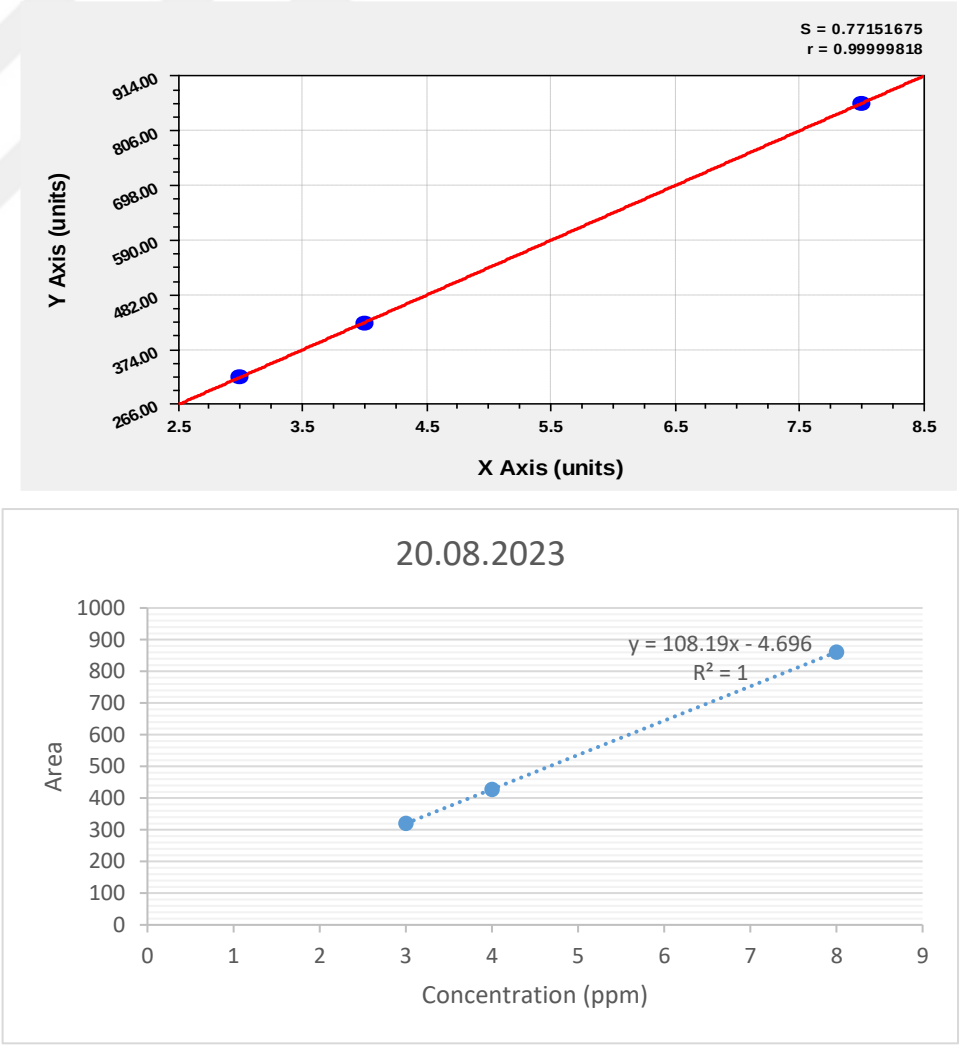
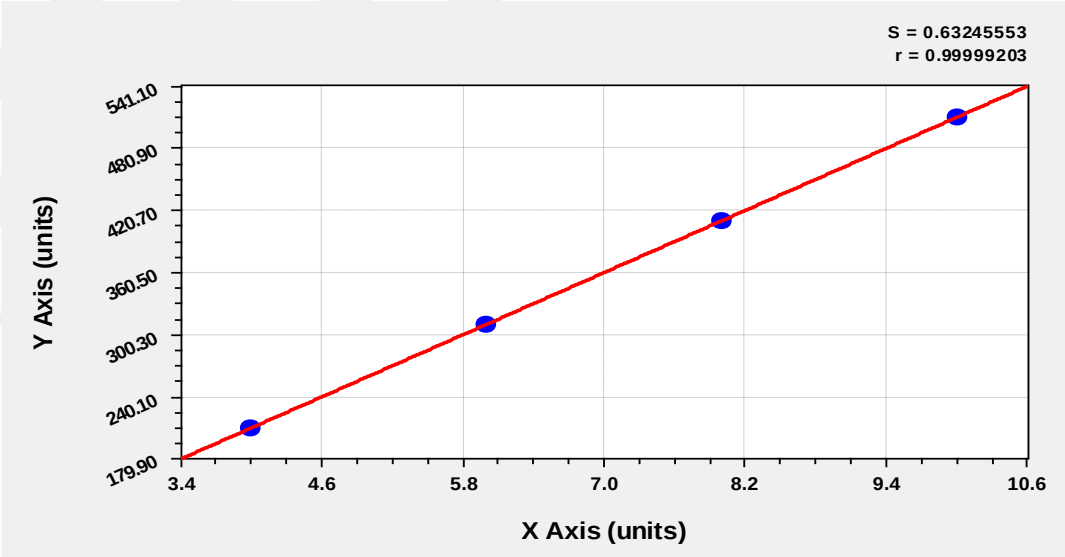


Figure 0.69. Calibration curves of Aldrin in mixture II of mix B on August 2023



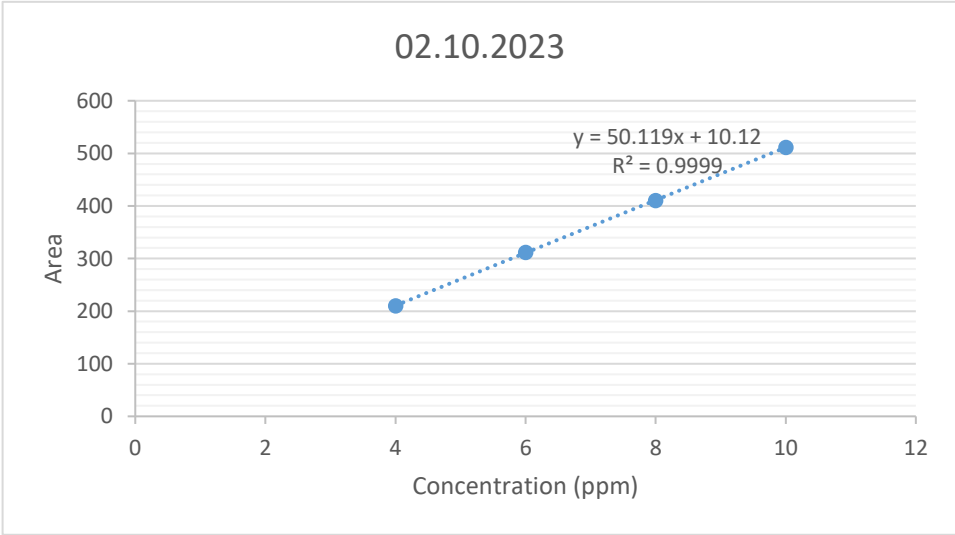


Figure 0.70. Calibration curves of Aldrin in mixture II of mix B on October 2023

Table 0.168. Names of method for Dieldrin in mixture II of mix B

dieldrin in mixture II	
Date	**Method**
8.05.2023	pestisitcalibration
10.06.2023	pestisitcal
18.06.2023	pestisitcal
25.06.2023	pestisitcal
3.07.2023	pestisitcal
20.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.169. Calculation of uncertainty of calibration curve for Dieldrin in mixture II of mix B on May 2023

8.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	12
2	394.968	1.21	-4.54	20.58	**C_0 (ppm)**	10
3	734.218	2.26	-3.49	12.21	**C_{ort}**	5.8
8	2,359.722	7.25	1.50	2.25	**S**	8.498
10	3,000.697	9.22	3.47	12.05	**B_1**	$3.25x10^2$
$\bar{C}$=5.8			**S_{xx}**	12	**p**	1
					n	4
					$u(C_0)$	0.035

Table 0.170. Calculation of uncertainty of calibration curve for Dieldrin in mixture II of mix B on June and July 2023

10.06.2023 / 25.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	3.7
5	240.136	4.47	-2.78	7.72	**C_0 (ppm)**	6
6	289.548	5.39	-1.86	3.46	**C_{ort}**	7.3
8	400.161	7.45	0.20	0.04	**S**	2.23
10	507.024	9.44	2.19	4.80	**B_1**	$5.37x10^1$
$\bar{C}$=7.3			**S_{xx}**	3.7	**p**	1
					n	4
					$u(C_0)$	0.034

Table 0.171. Calculation of uncertainty of calibration curve for Dieldrin in mixture II of mix B on June 2023

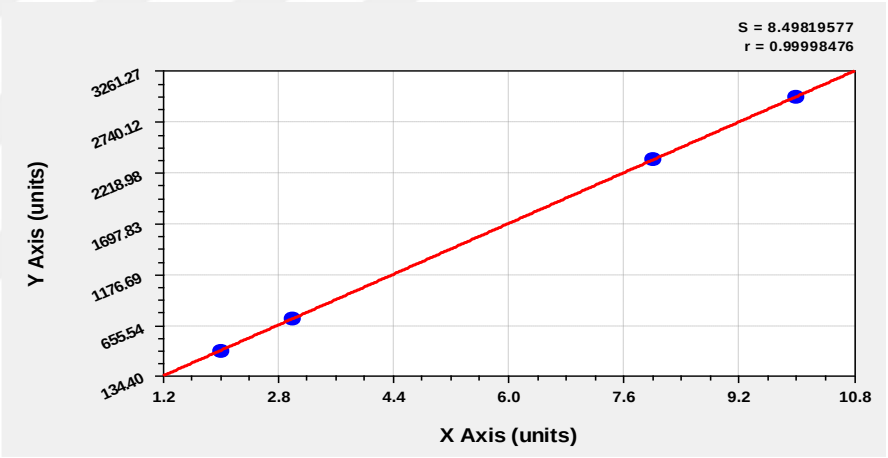
18.06.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	7.4
2	701.107	1.85	-4.35	18.88	**C_0 (ppm)**	6
5	1838.448	4.86	-1.34	1.79	**C_{ort}**	4.3
6	2197.522	5.81	-0.39	0.15	**S**	10.411
8	2959.371	7.83	1.63	2.65	**B_1**	$3.78x10^2$
10	3730.253	9.87	3.67	13.45	**p**	1
$\bar{C}$=4.3			**S_{xx}**	7.4	**n**	5
					$u(C_0)$	0.023

Table 0.172. Calculation of uncertainty of calibration curve for Dieldrin in mixture II of mix B on August 2023

20.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	5.4
2	221.032	1.54	-2.71	7.33	**C_0 (ppm)**	4
3	365.058	2.55	-1.70	2.89	**C_{ort}**	4.3
4	511.506	3.57	-0.68	0.46	**S**	2.11
8	1080.95	7.55	3.30	10.87	**B_1**	$1.43x10^2$
$\bar{C}$=4.3			**S_{xx}**	5.4	**p**	1
					n	4
					$u(C_0)$	0.008

Table 0.173. Calculation of uncertainty of calibration curve for Dieldrin in mixture II of mix B on October 2023

2.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	9.3
2	281.047	1.65	-4.60	21.20	**C_0 (ppm)**	5
5	782.51	4.58	-1.67	2.78	**C_{ort}**	6.3
8	1290.986	7.56	1.31	1.71	**S**	26.53
10	1650.578	9.66	3.41	11.66	**B_1**	$1.71x10^2$
$\bar{C}$=6.3			**S_{xx}**	9.3	**p**	1
					n	4
					$u(C_0)$	0.100



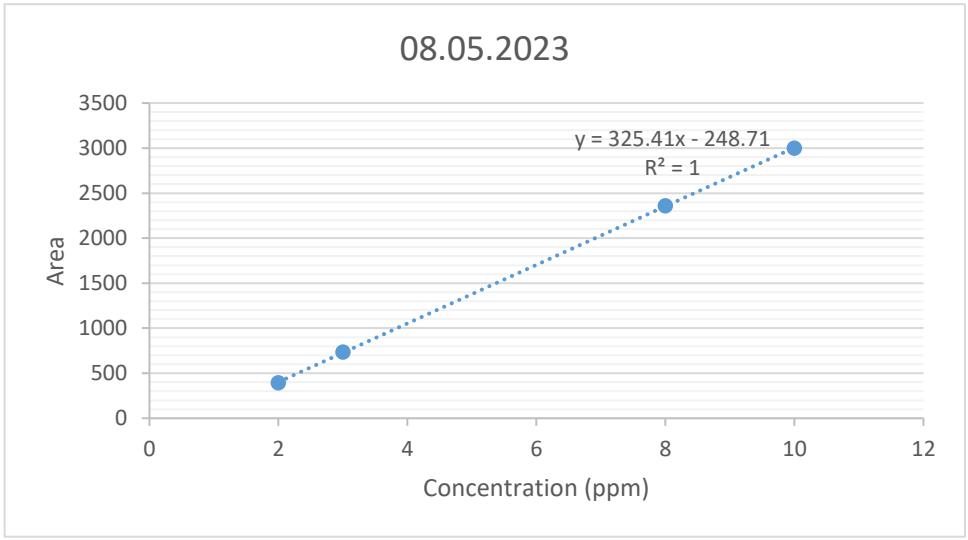


Figure 0.71. Calibration curves of Dieldrin in mixture II of mix B on May 2023

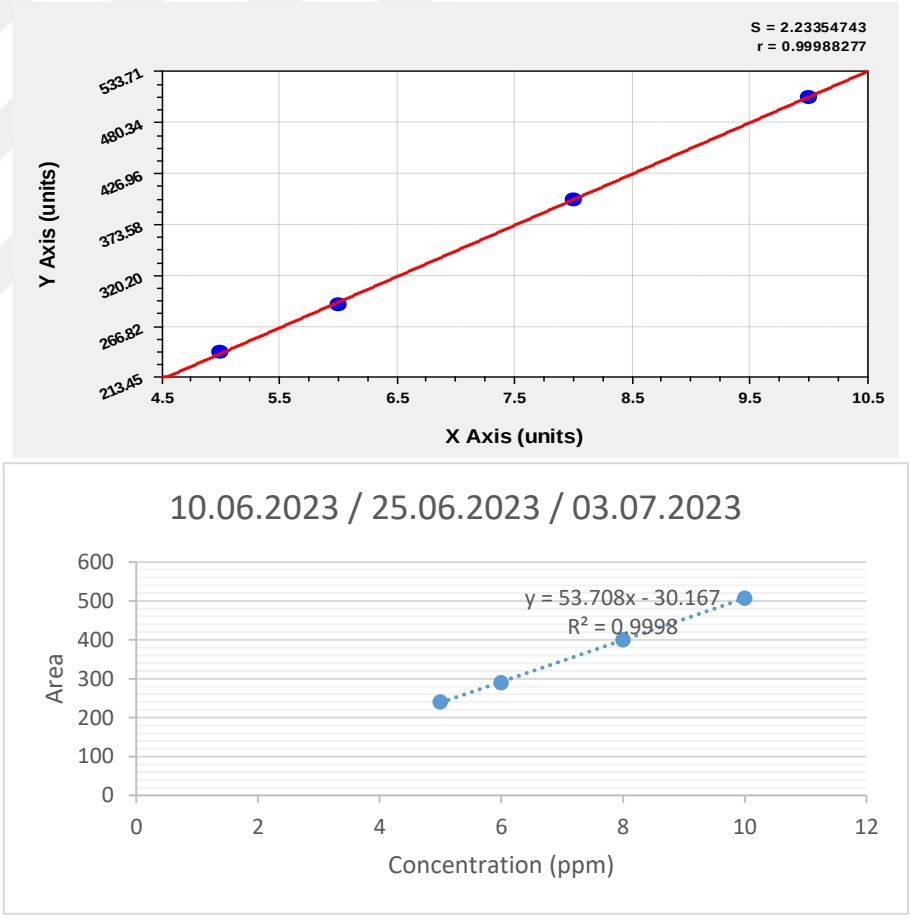


Figure 0.72. Calibration curves of Dieldrin in mixture II of mix B on June and July 2023

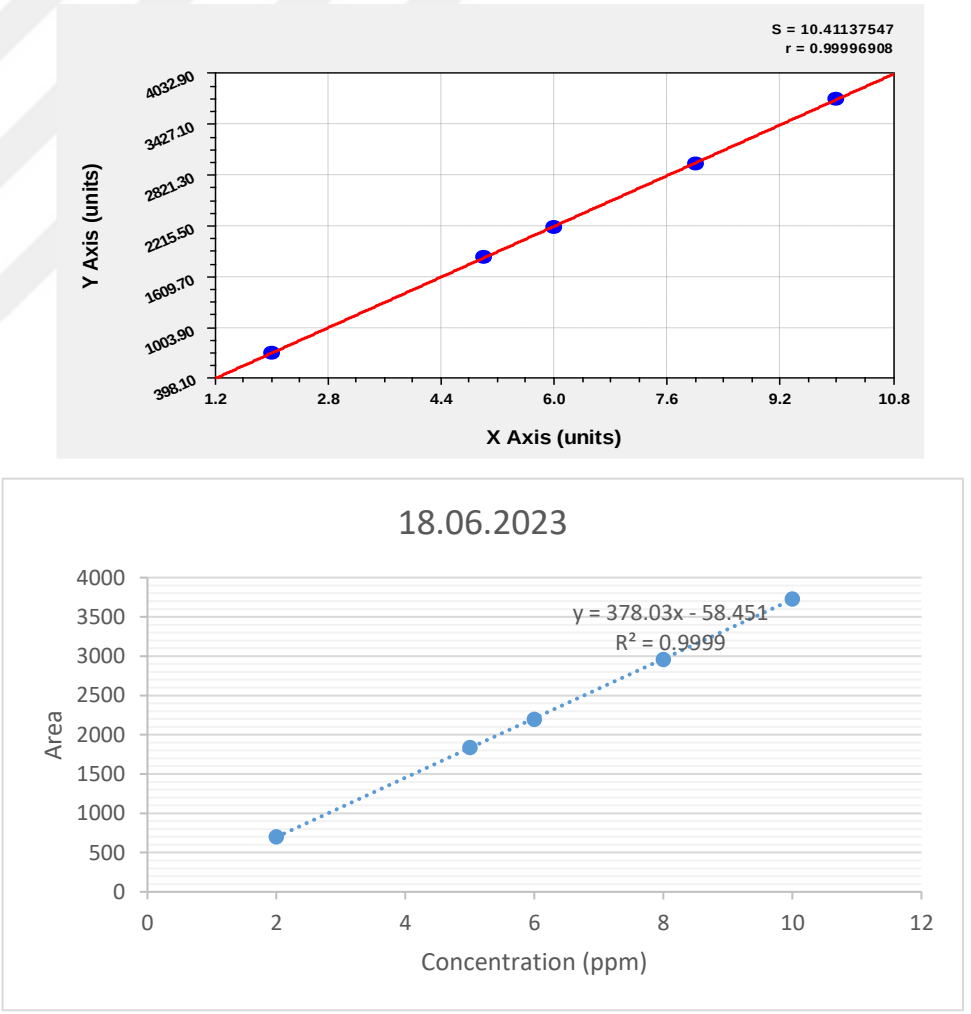
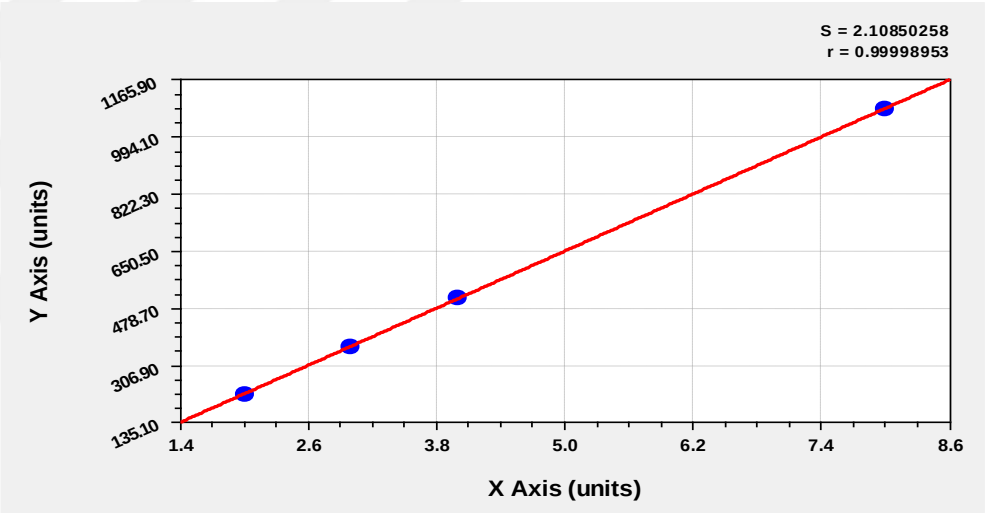


Figure 0.73. Calibration curves of Dieldrin in mixture II of mix B on June 2023



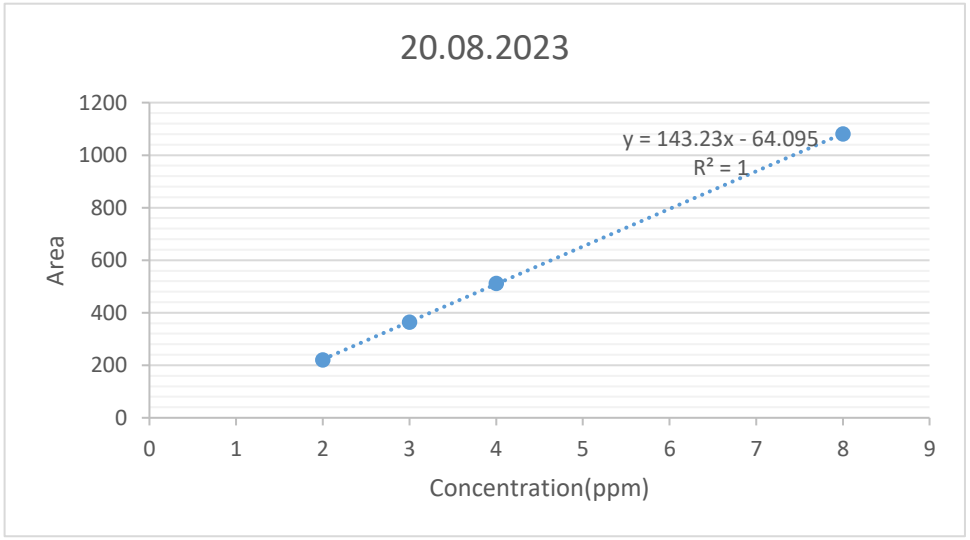
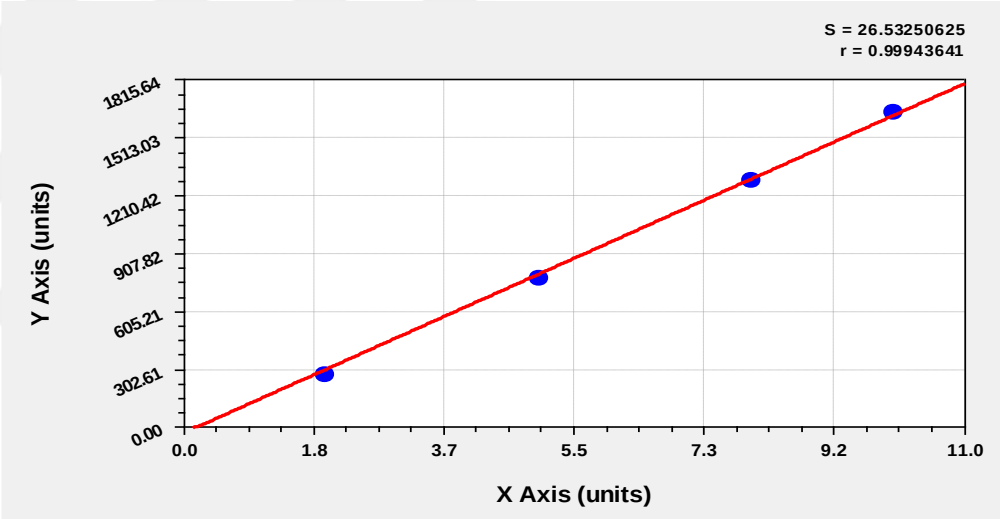


Figure 0.74. Calibration curves of Dieldrin in mixture II of mix B on August 2023



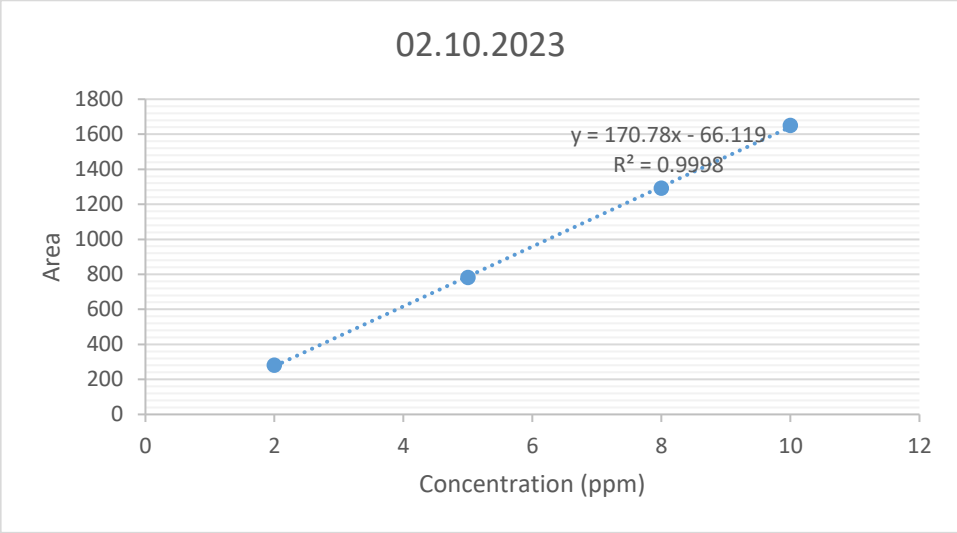


Figure 0.75. Calibration curves of Dieldrin in mixture II of mix B on October 2023

Table 0.174. Names of method for Endrin in mixture II of mix B

endrin in mixture II	
Date	**Method**
11.05.2023	pestisitcalibration
10.06.2023	pestisitcal
19.06.2023	pestisitcal
26.06.2023	pestisitcal
3.07.2023	pestisitcal
20.08.2023	Pestisitcalmix102

Table 0.175. Calculation of uncertainty of calibration curve for Endrin in mixture II of mix B on May and July 2023

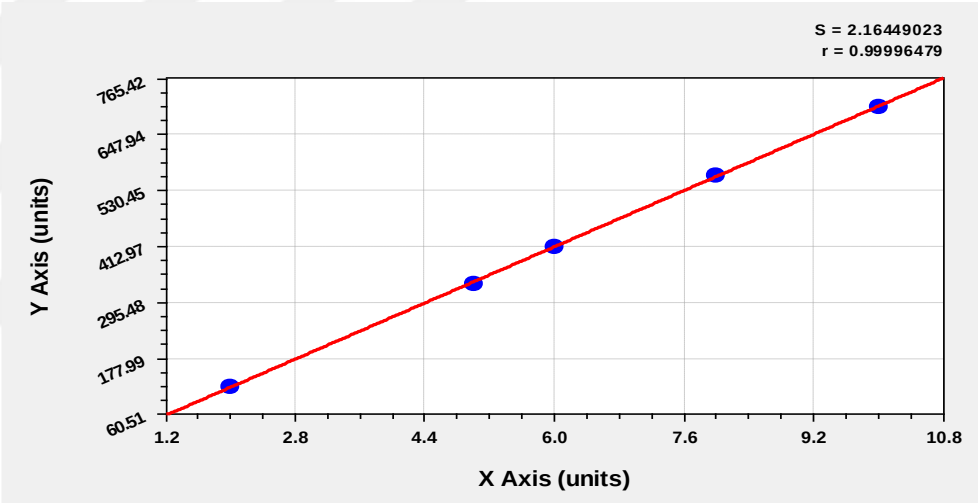
11.05.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	7
2	119.251	1.62	-4.58	20.97	**C_0 (ppm)**	6
5	335.968	4.57	-1.63	2.67	**C_{ort}**	6.2
6	412.587	5.61	-0.59	0.35	**S**	2.16
8	561.735	7.63	1.43	2.05	**B_1**	$7.36x10^1$
10	706.168	9.60	3.40	11.53	**p**	1
$\bar{C}$=6.2			**S_{xx}**	7	**n**	5
					u(C_0)	0.013

Table 0.176. Calculation of uncertainty of calibration curve for Endrin in mixture II of mix A on June and July 2023

10.06.2023 / 18.06.2023 / 25.06.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	6.8
2	128.078	1.44	-4.76	22.61	**C_0 (ppm)**	6
5	412.673	4.66	-1.54	2.39	**C_{ort}**	6.2
6	482.389	5.44	-0.76	0.58	**S**	9.19
8	667.801	7.53	1.33	1.78	**B_1**	$8.86x10^1$
10	839.412	9.47	3.27	10.69	**p**	1
$\bar{C}$=6.2			**S_{xx}**	6.8	**n**	5
					$u(C_0)$	0.047

Table 0.177. Calculation of uncertainty of calibration curve for Endrin in mixture II of mix B on August and October 2023

28.08.2023/02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10.1
2	53.641	1.34	-3.66	13.41	**C_0 (ppm)**	3
3	95.277	2.38	-2.62	6.88	**C_{ort}**	5
10	375.007	9.35	4.35	18.95	**S**	1.10
$\bar{C}$=5			**S_{xx}**	10.1	**B_1**	$4.01x10^1$
					p	1
					n	3
					$u(C_0)$	0.023



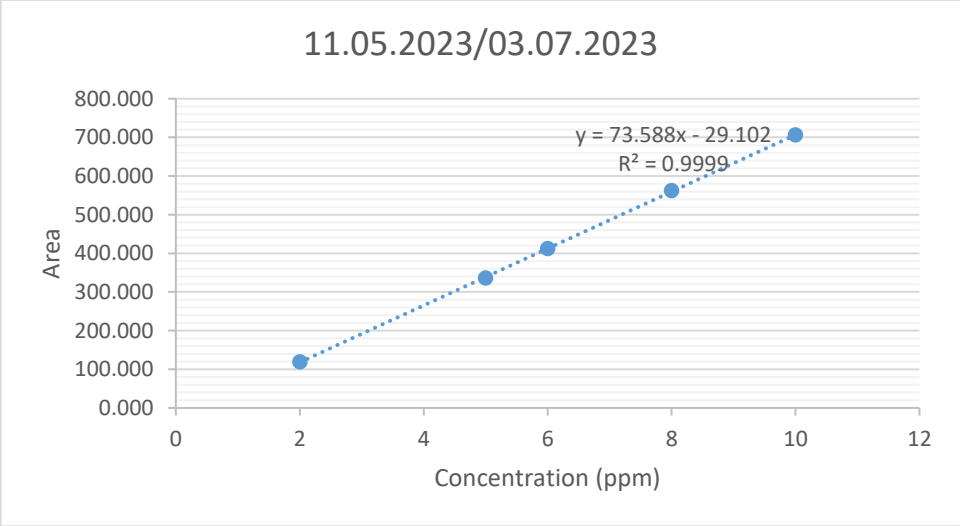
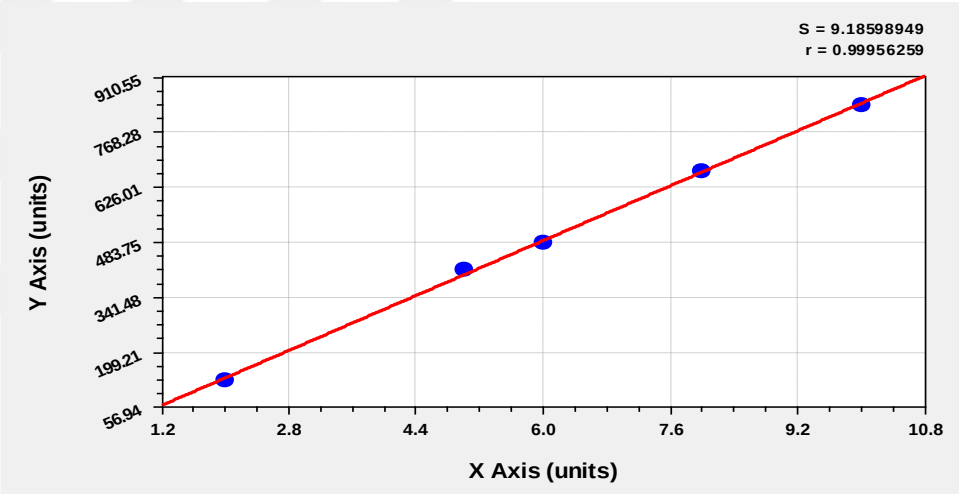


Figure 0.76. Calibration curves of Endrin in mixture II of mix B on May and July 2023



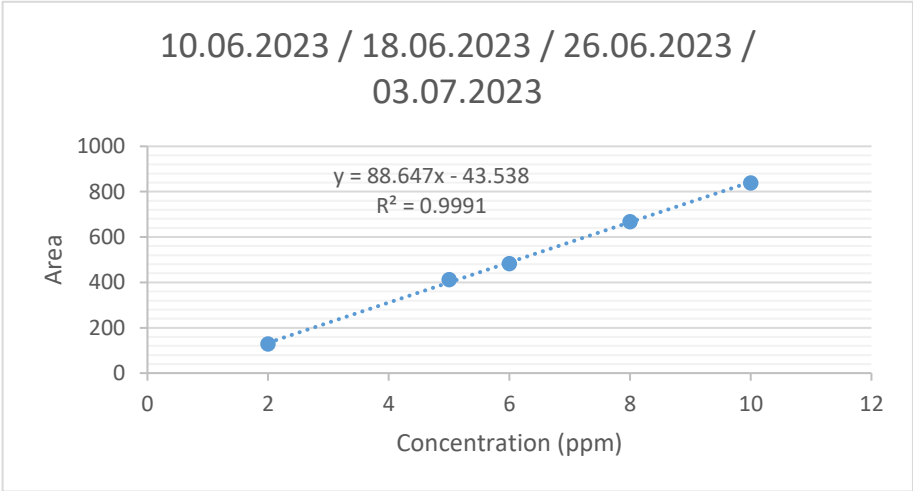
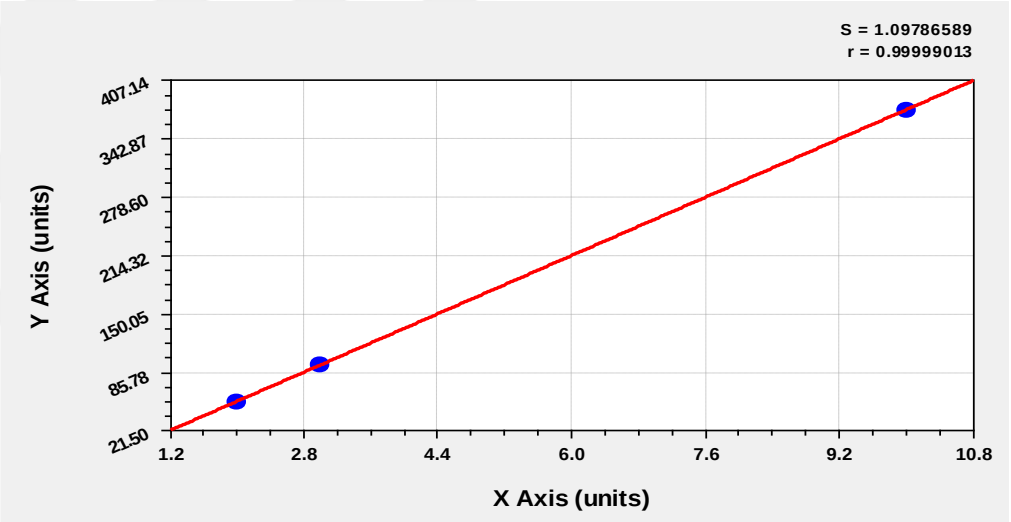


Figure 0.77. Calibration curves of Endrin in mixture II of mix B on June and July 2023



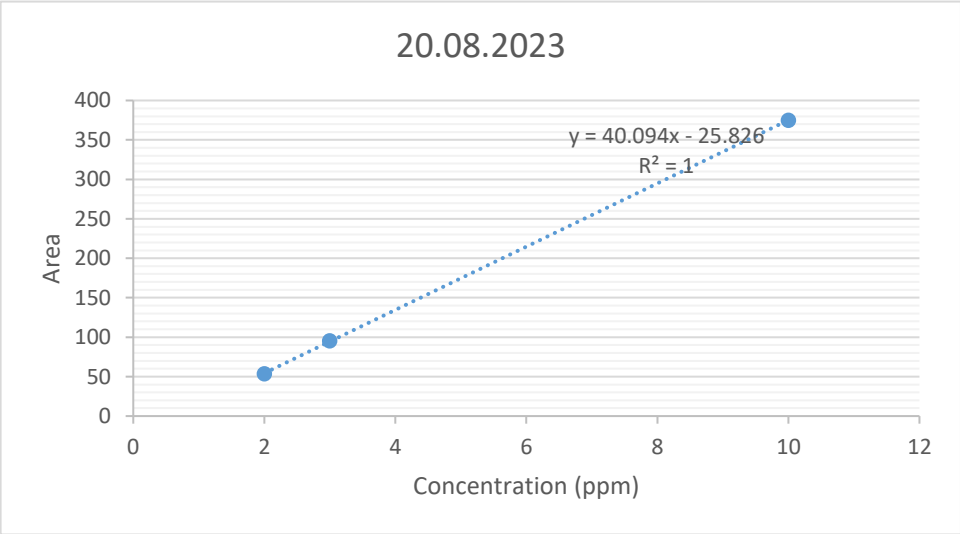


Figure 0.78. Calibration curves of Endrin in mixture II of mix A on August 2023

Table 0.178. Names of method for 4,4'-DDD in mixture II of mix B

4,4'-DDD in mixture II	
Date	**Method**
8.05.2023	pestisitcalibration
11.06.2023	pestisitcal
19.06.2023	pestisitcal
3.07.2023	pestisitcal
20.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.179. Calculation of uncertainty of calibration curve for 4,4'-DDD in mixture II of mix B on May 2023

8.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	39
2	660.516	1.34	-3.66	13.38	**C_0 (ppm)**	3
3	1,178.176	2.39	-2.61	6.79	**C_{ort}**	5
10	4,607.489	9.36	4.36	19.04	**S**	18.20
$\bar{C}$=5			**S_{xx}**	39	**B_1**	$4.92x10^2$
					p	1
					n	3
					$u(C_0)$	0.024

Table 0.180. Calculation of uncertainty of calibration curve for 4,4'-DDD in mixture II of mix B on June 2023

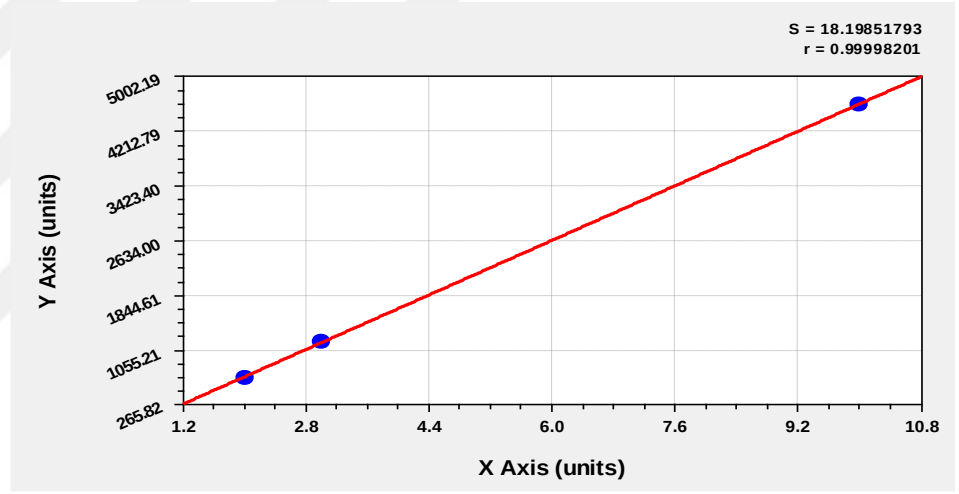
11.06.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	9.450
2	320.673	1.50	-4.75	22.60	**C_0 (ppm)**	5
5	956.853	4.46	-1.79	3.20	**C_{ort}**	6.25
8	1613.057	7.52	1.27	1.62	**S**	7.550
10	2,030.935	9.47	3.22	10.38	**B_1**	214.42
$\bar{C}$=5.8			**S_{xx}**	8.5	**p**	1
					n	4
					$u(C_0)$	0.023

Table 0.181. Calculation of uncertainty of calibration curve for 4.4'-DDD in mixture II of mix B on June and July 2023

19.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	8.456
2	753.632	1.45	-4.30	18.46	**C_0 (ppm)**	5
5	2365.948	4.56	-1.19	1.41	**C_{ort}**	5
6	2,826.896	5.45	-0.30	0.09	**S**	33.136
10	4,913.095	9.47	3.72	13.86	**B_1**	321.72
$\bar{C}$=5			**S_{xx}**	8.5	**p**	1
					n	4
					$u(C_0)$	0.05

Table 0.182. Calculation of uncertainty of calibration curve for 4,4'-DDD in mixture II of mix B on August and October 2023

20.08.2023/02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10.6
2	413.747	1.28	-3.72	13.84	**C_0 (ppm)**	3
3	735.821	2.28	-2.72	7.42	**C_{ort}**	5
10	2,999.850	9.28	4.28	18.30	**S**	0.891
$\overline{C}$=5			**S_{xx}**	10.6	**B_1**	$3.23x10^2$
					p	1
					n	3
					$u(C_0)$	0.002



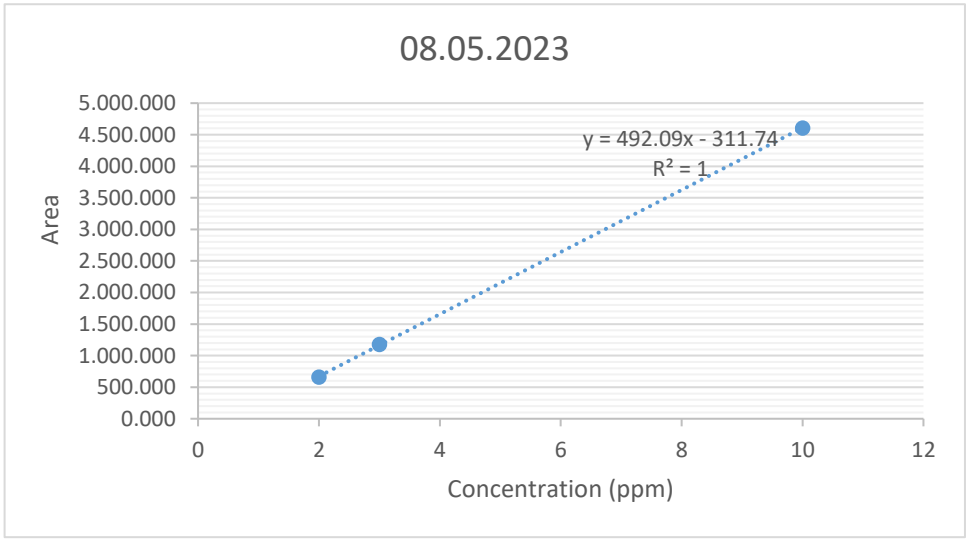
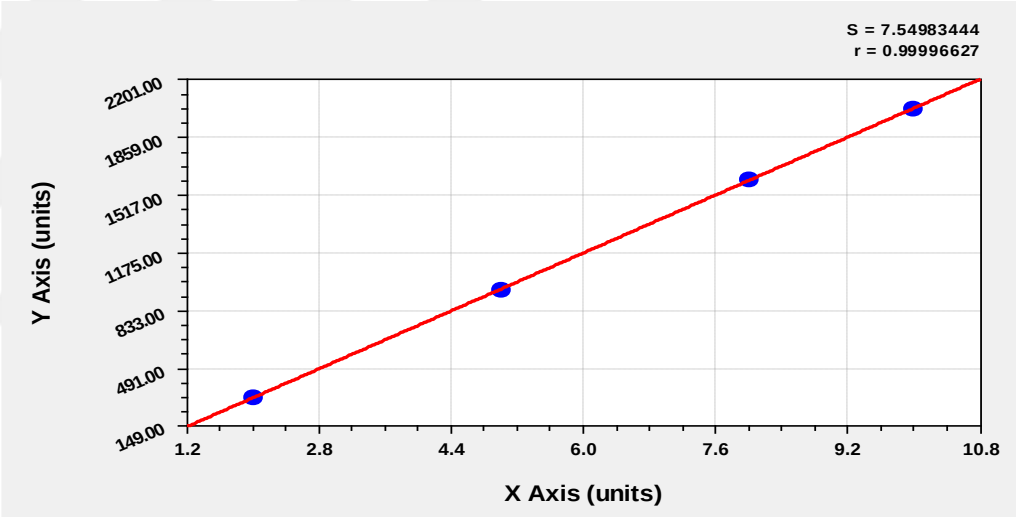


Figure 0.79. Calibration curves of 4,4’-DDD in mixture II of mix B on May 2023



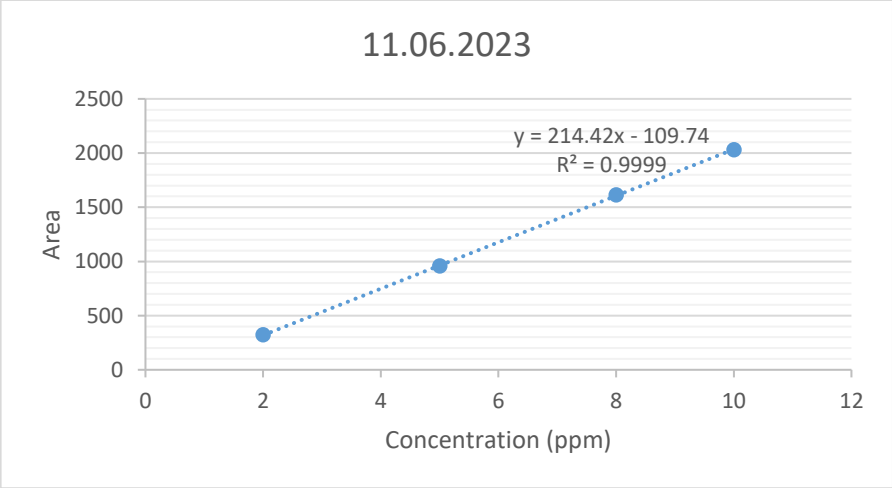
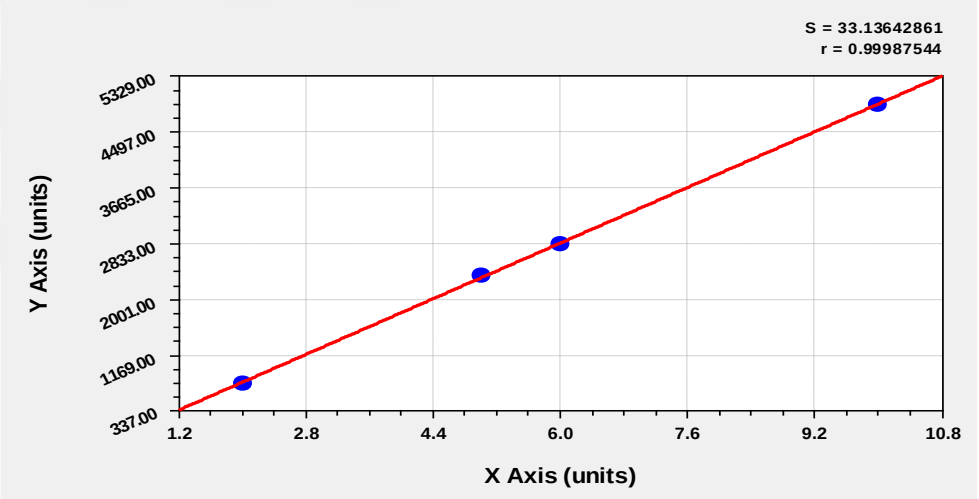


Figure 0.80. Calibration curves of 4,4'-DDD in mixture II of mix B on June 2023



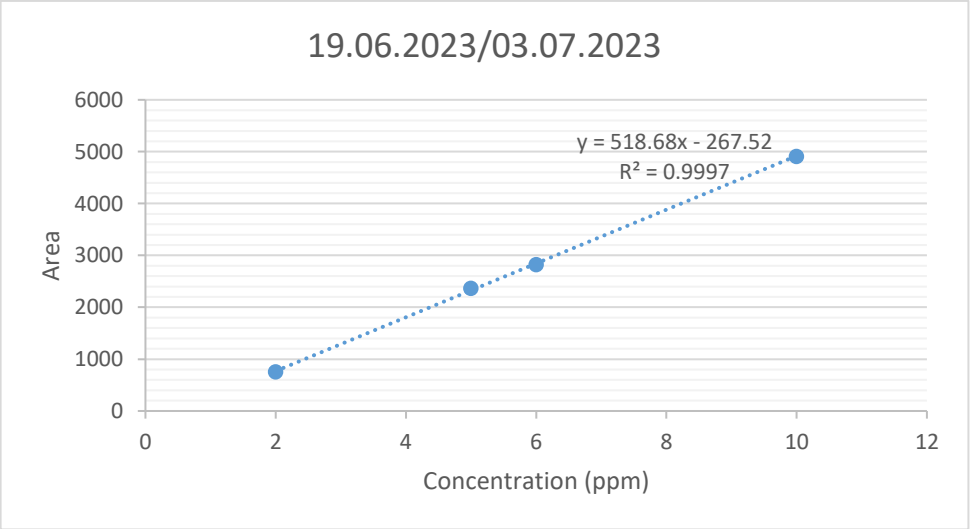
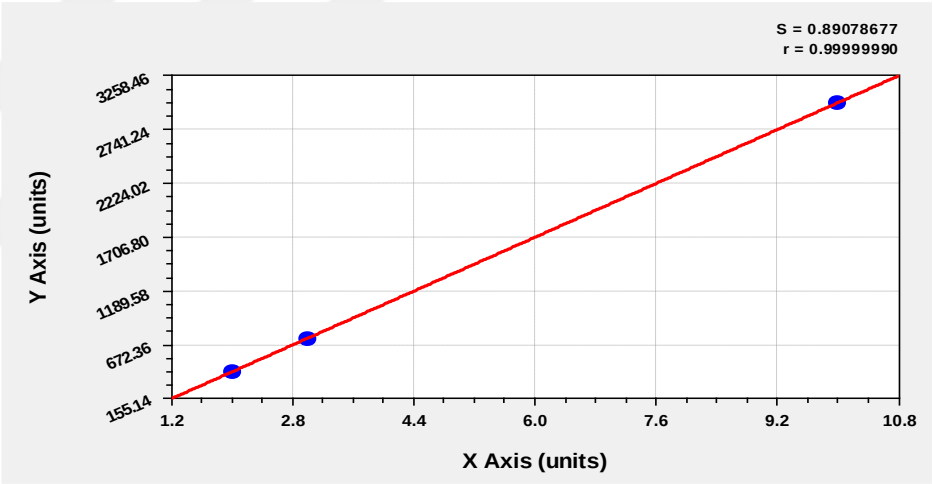


Figure 0.81. Calibration curves of 4,4'-DDD in mixture II of mix B on June and July 2023



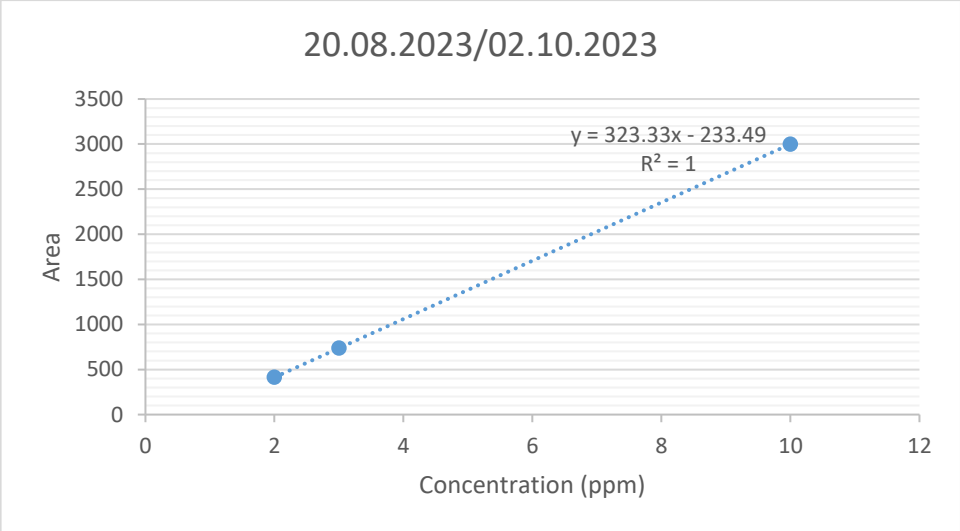


Figure 0.82. Calibration curves of 4,4’-DDD in mixture II of mix B on August and October 2023

Table 0.183. Names of method for 4,4'-DDT in mixture II of mix B

4,4'-DDT in mixture II	
Date	**Method**
10.06.2023	pestisitcal
19.06.2023	pestisitcal
26.06.2023	pestisitcal
3.07.2023	pestisitcal
21.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.184. Calculation of uncertainty of calibration curve for 4,4'-DDT in mixture II of mix B on June and July 2023

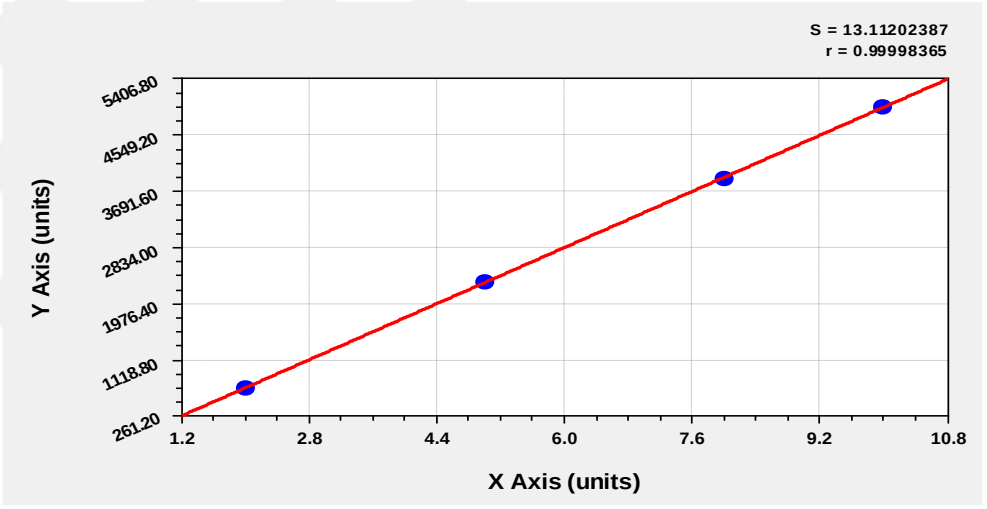
10.06.2023 / 19.06.2023 / 26.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10
2	690.331	1.29	-4.96	24.59	**C_0 (ppm)**	5
5	2.311.195	4.32	-1.93	3.72	**C_{ort}**	6.3
8	3,891.102	7.28	1.03	1.05	**S**	13.11
10	4,978.040	9.31	3.06	9.35	**B_1**	164.17
$\bar{C}$=6.3			**S_{xx}**	10	**p**	1
					n	4
					u(C_0)	0.011

Table 0.185. Calculation of uncertainty of calibration curve for 4,4'-DDT in mixture II of mix B on August 2023

21.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	5.8
2	199.296	1.21	-3.04	9.22	**C_0 (ppm)**	4
3	361.106	2.20	-2.05	4.20	**C_{ort}**	4.3
4	521.46	3.18	-1.07	1.15	**S**	3.41
8	1,183.111	7.21	2.96	8.74	**B_1**	164.17
$\bar{C}$=4.3			**S_{xx}**	5.8	**p**	1
					n	4
					u(C_0)	0.011

Table 0.186. Calculation of uncertainty of calibration curve for 4,4'-DDT in mixture II of mix B on October 2023

2.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10.2
2	190.415	0.98	-5.27	27.81	**C_0 (ppm)**	5
5	776.58	3.98	-2.27	5.15	**C_{ort}**	6.3
8	1367.69	7.01	0.76	0.58	**S**	5.04
10	1,748.009	8.96	2.71	7.35	**B_1**	195.06
$\bar{C}$=6.3			**S_{xx}**	10.2	**p**	1
					n	4
					u(C_0)	0.016



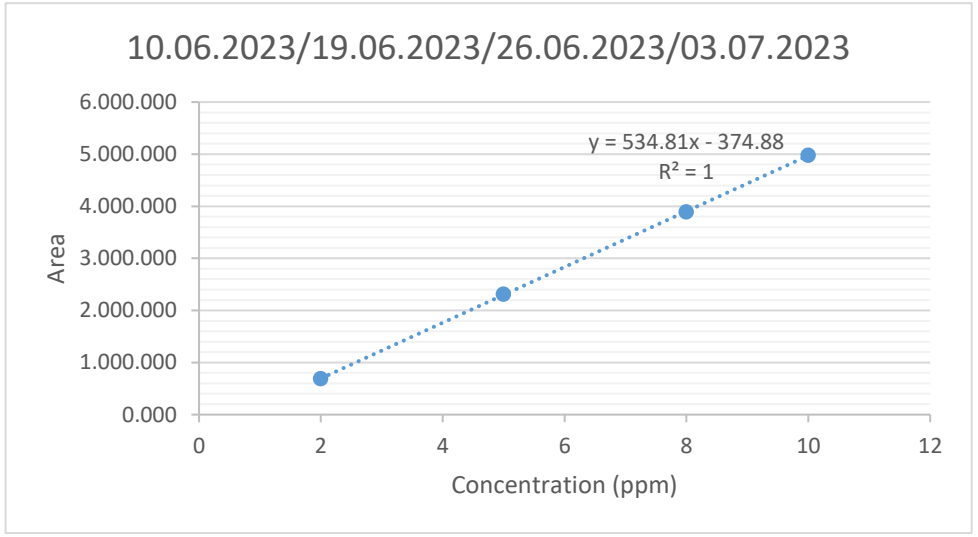
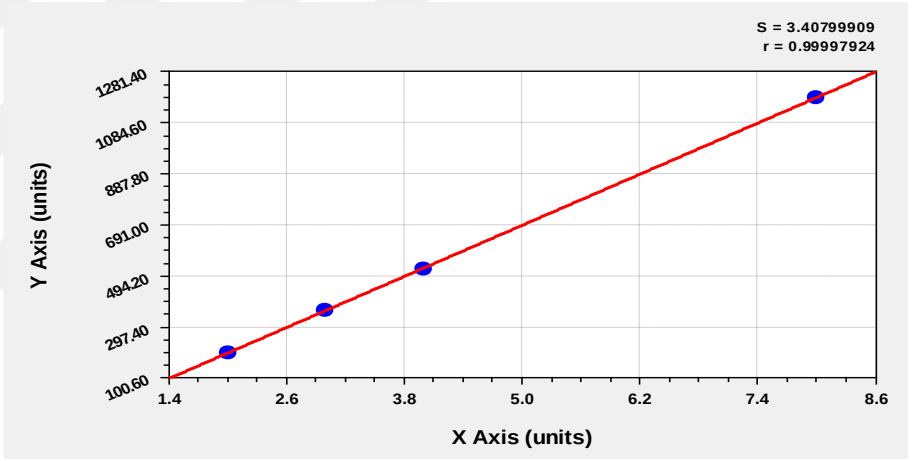


Figure 0.83. Calibration curves of 4,4'-DDT in mixture II of mix B on June and July 2023



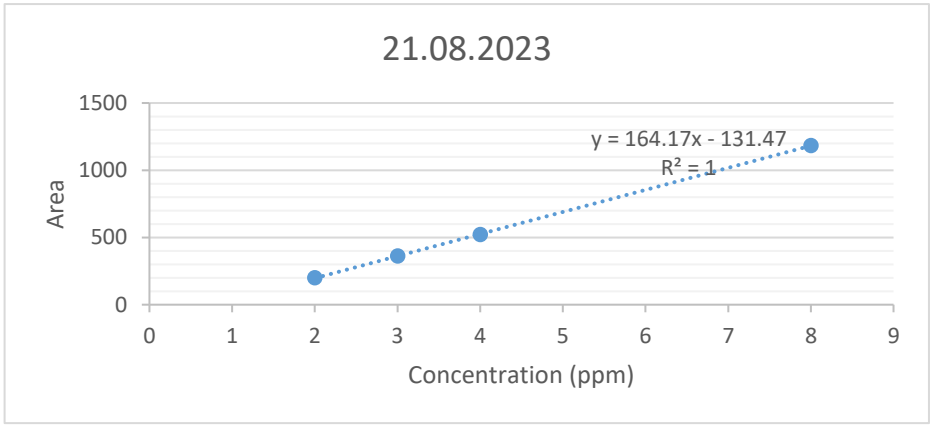
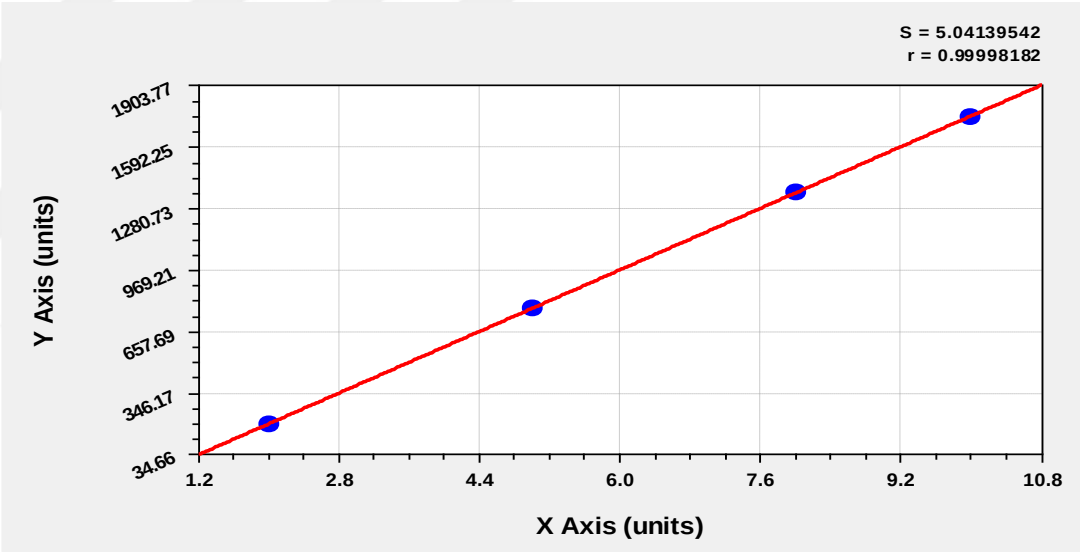


Figure 0.84. Calibration curves of 4,4'-DDT in mixture II of mix B on August 2023



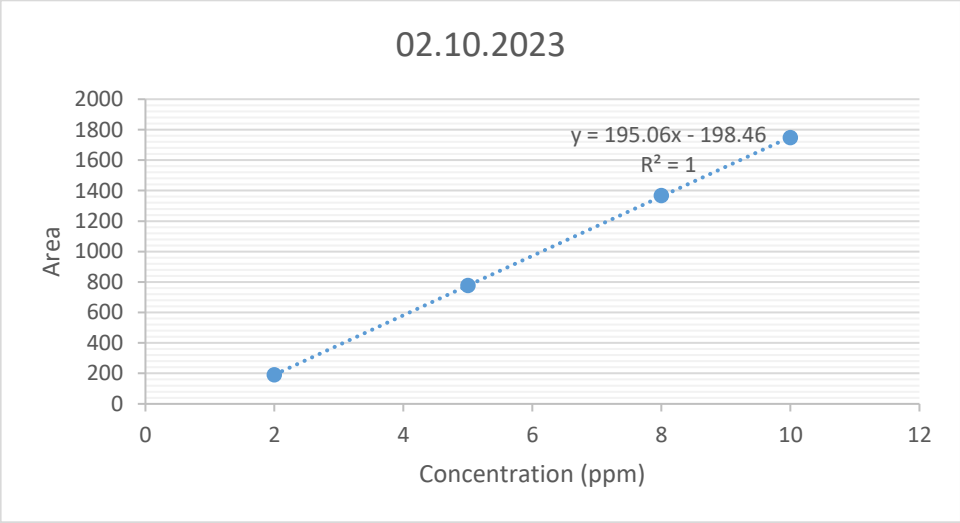


Figure 0.85. Calibration curves of 4,4’-DDT in mixture II of mix B on October 2023

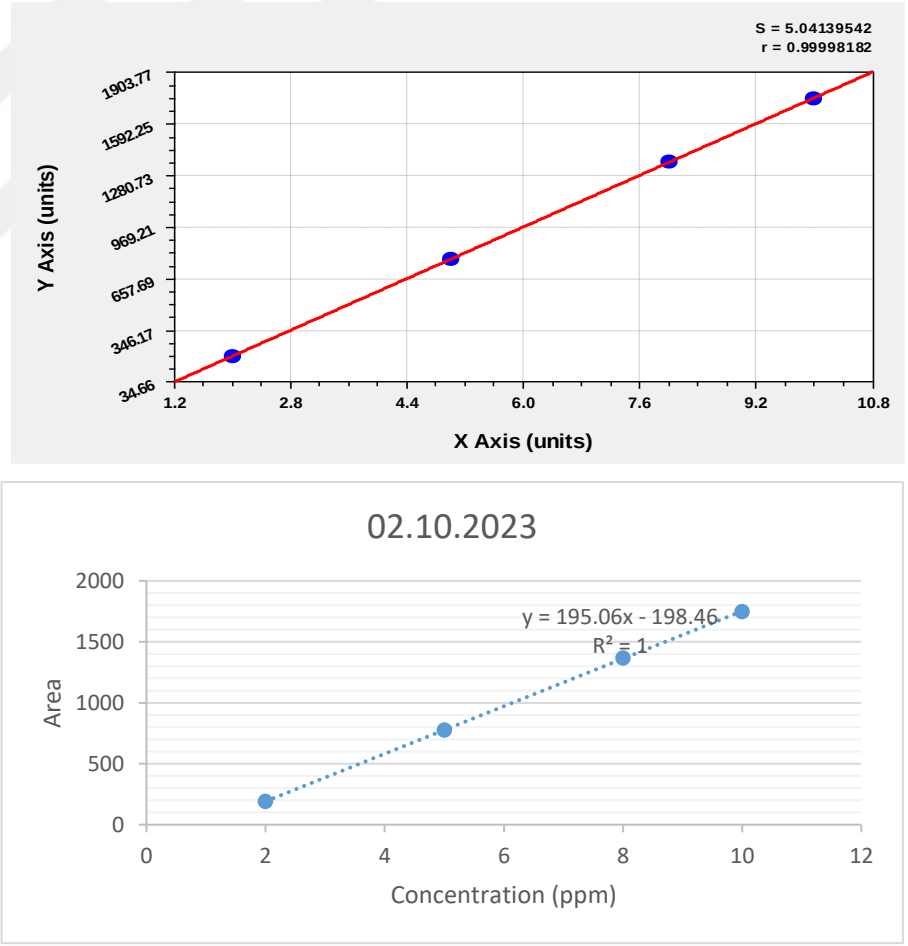


Figure 0.86. Calibration curves of 4,4’-DDT in mixture II of mix B on October 2023

Table 0.187. Names of method for 2,4'-DDT in mixture II of mix B

2,4'-DDT in mixture II	
Date	**Method**
11.06.2023	pestisitcal
19.06.2023	pestisitcal
26.06.2023	pestisitcal
3.07.2023	pestisitcal
21.08.2023	pestcal
2.10.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.188. Calculation of uncertainty of calibration curve for 2,4'-DDT in mixture II of mix B on June and July 2023

11.06.2023 / 19.06.2023 / 26.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10
2	433.453	0.98	-5.52	30.48	**C_0 (ppm)**	6
6	2,237.789	5.06	-1.44	2.09	**C_{ort}**	6.5
8	3,074.361	6.95	0.45	0.20	**S**	24.97
10	3,986.135	9.00	2.50	6.27	**B_1**	442.67
$\bar{C}$=6.5			**S_{xx}**	10	**p**	1
					n	4
					u(C_0)	0.030

Table 0.189. Calculation of uncertainty of calibration curve for 2,4'-DDT in mixture II of mix A on June and July 2023

21.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	16.6
2	144.798	1.05	-3.20	10.27	**C_0 (ppm)**	4
3	287.067	2.07	-2.18	4.74	**C_{ort}**	4.3
4	417.915	3.02	-1.23	1.52	**S**	4.28
8	976.820	7.05	7.05	49.74	**B_1**	138.50
$\bar{C}$=4.3			**S_{xx}**	16.6	**p**	1
					n	4
					$u(C_0)$	0.016

Table 0.190. Calculation of uncertainty of calibration curve for 2,4'-DDT in mixture II of mix B on October 2023

02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	14.0
2	131.938	0.83	-4.17	17.43	**C_0 (ppm)**	3
3	292.153	1.83	-3.17	10.07	**C_{ort}**	5
10	1,411.358	8.83	3.83	14.64	**S**	0.22
$\bar{C}$=5			**S_{xx}**	14.0	**B_1**	1.60×10^2
					p	1
					n	3
					$u(C_0)$	0.001

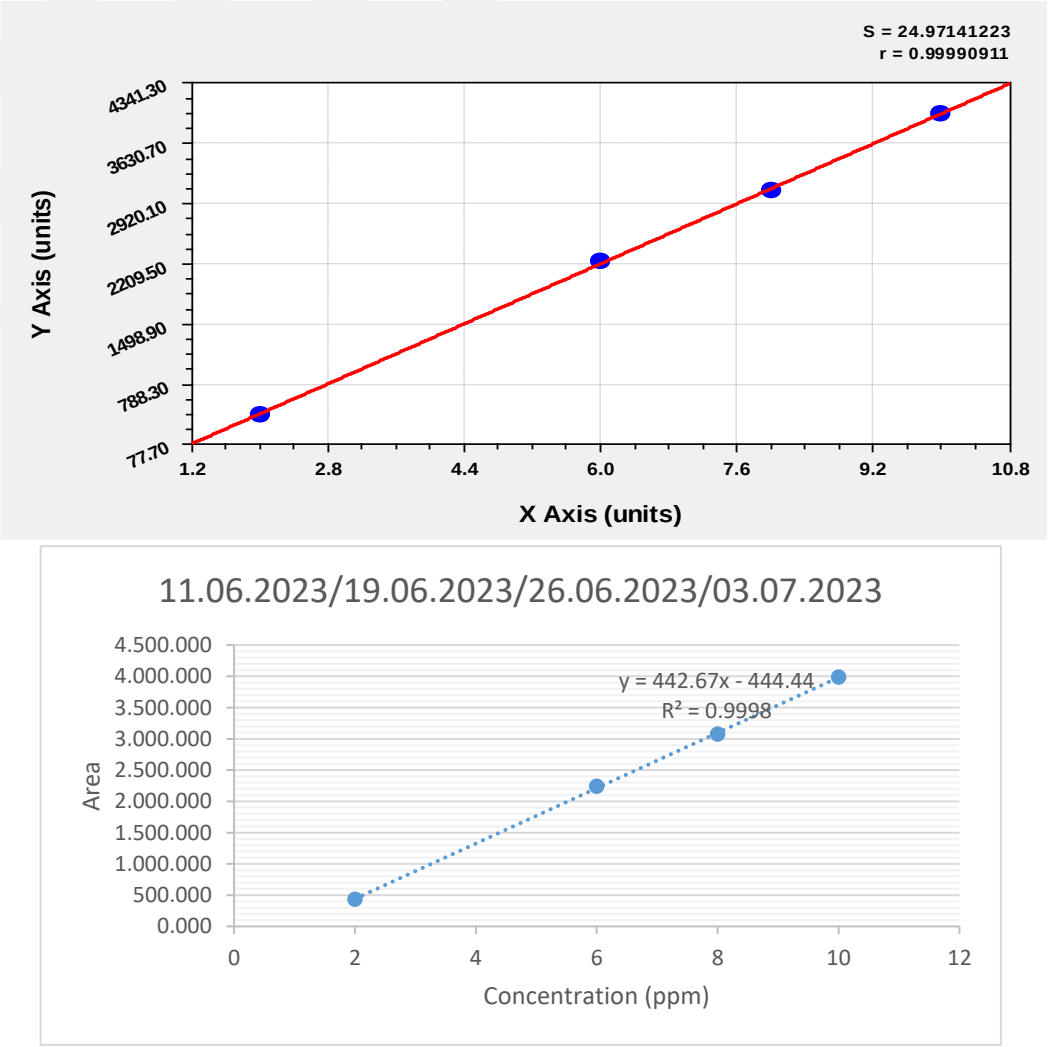
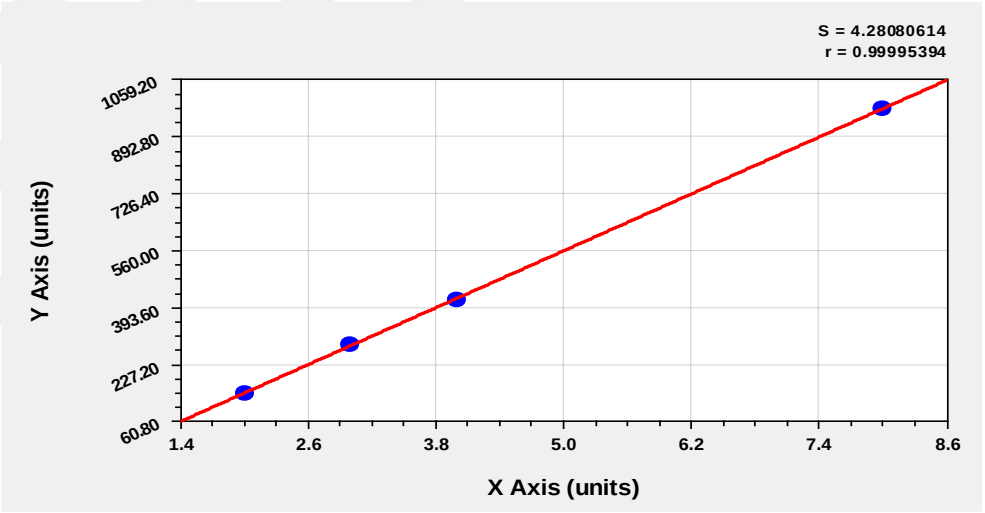


Figure 0.87. Calibration curves of 2,4'-DDT in mixture II of mix B on June and July 2023



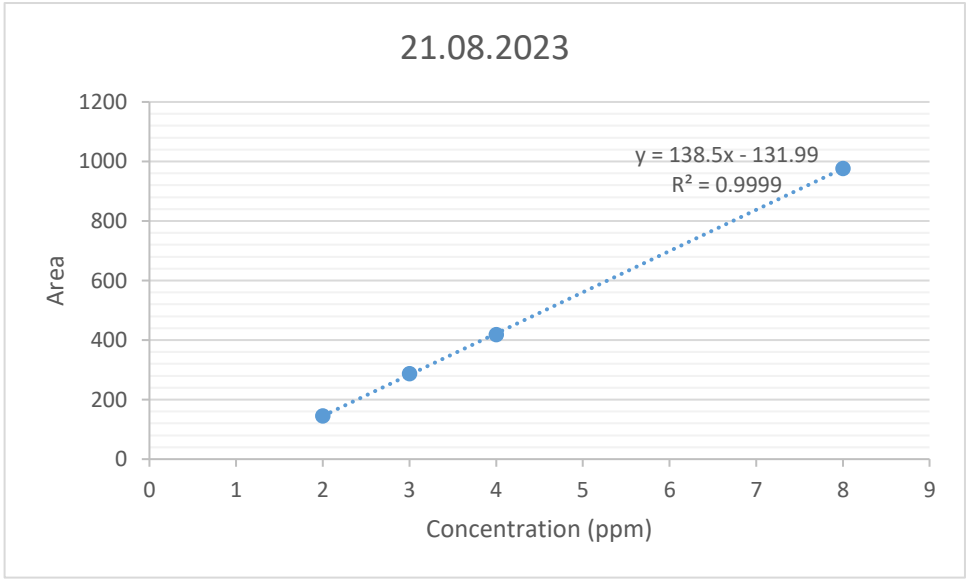
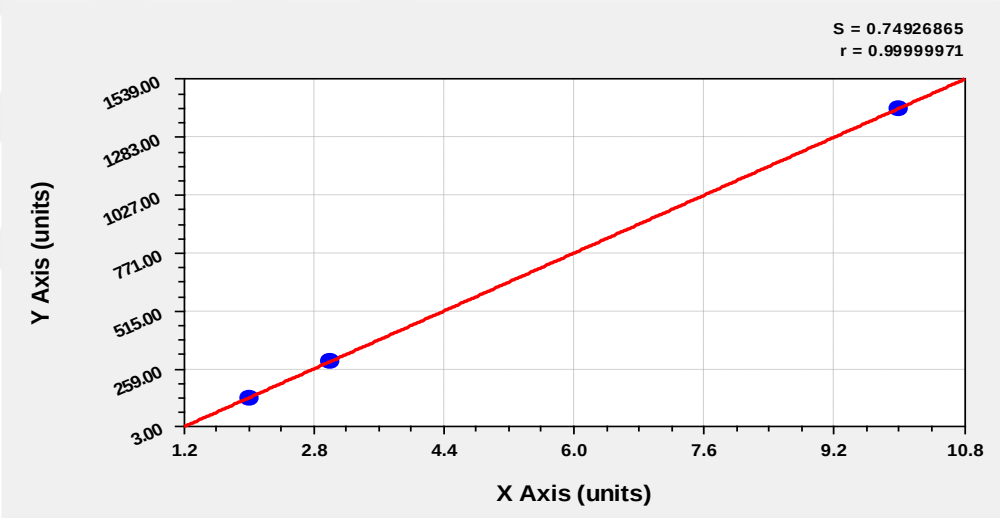


Figure 0.88. Calibration curves of 2,4'-DDT in mixture II of mix B on August 2023



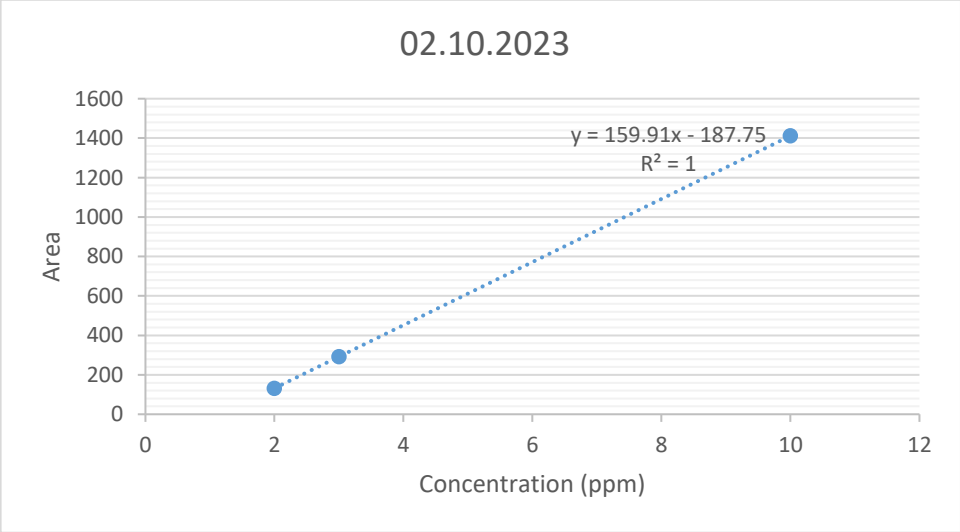


Figure 0.89. Calibration curves of 2,4'-DDT in mixture II of mix B on August and October 2023

Table 0.191. Names of method for *alpha*-Endosulfan in mixture II of mix B

***alpha*-endosulfan in mixture II**	
Date	**Method**
9.05.2023	pestisitcalibration
11.06.2023	pestisitcal
19.06.2023	pestisitcal
25.06.2023	pestisitcal
3.07.2023	pestisitcal
28.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.192. Calculation of uncertainty of calibration curve for *alpha*-Endosulfan in mixture II of mix B on May, June and July 2023

09.05.2023 / 11.06.2023 / 19.06.2023 / 25.06.2023 / 03.07 2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	7
2	36.448	1.85	-4.35	18.93	**C_0 (ppm)**	6
5	95.000	4.82	-1.38	1.90	**C_{ort}**	6.2
6	113.775	5.77	-0.43	0.18	**S**	1.32
8	154.127	7.82	1.62	2.63	**B_1**	19.71
10	194.105	9.85	3.65	13.32	**p**	1
$\bar{C}$=6.2			**S_{xx}**	7	**n**	5
					u(C_0)	**0.030**

Table 0.193. Calculation of uncertainty of calibration curve for *alpha*-Endosulfan in mixture II of mix A on August 2023

20.08.2023 / 02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	9.7
2	29.28	1.75	-3.00	9.01	**C_0 (ppm)**	4
3	46.247	2.76	-1.99	3.96	**C_{ort}**	4.8
4	63.692	3.80	-0.95	0.90	**S**	0.49
10	163.473	9.76	5.01	25.10	**B_1**	16.71
$\bar{C}$=4.8			**S_{xx}**	9.7	**p**	1
					n	4
					$u(C_0)$	0.016

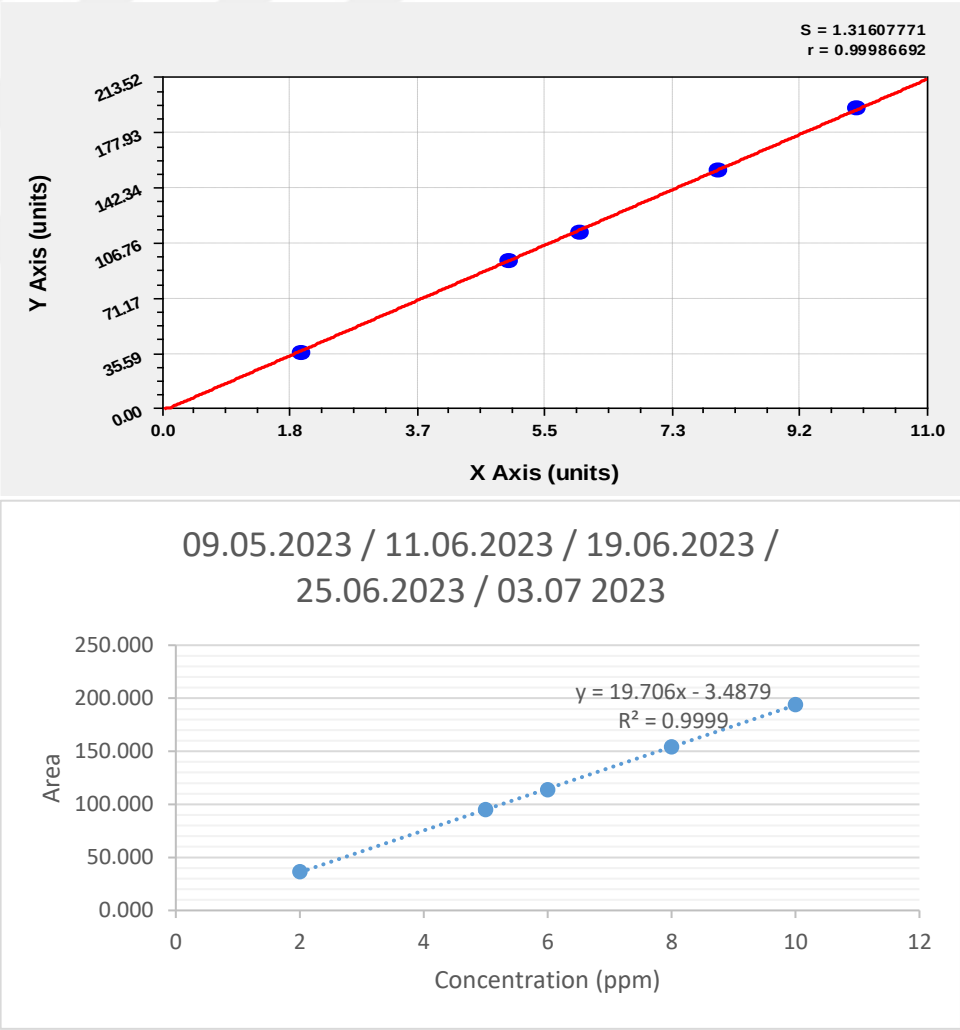


Figure 0.90. Calibration curves of *alpha*-Endosulfan in mixture II of mix B on May, June and July 2023

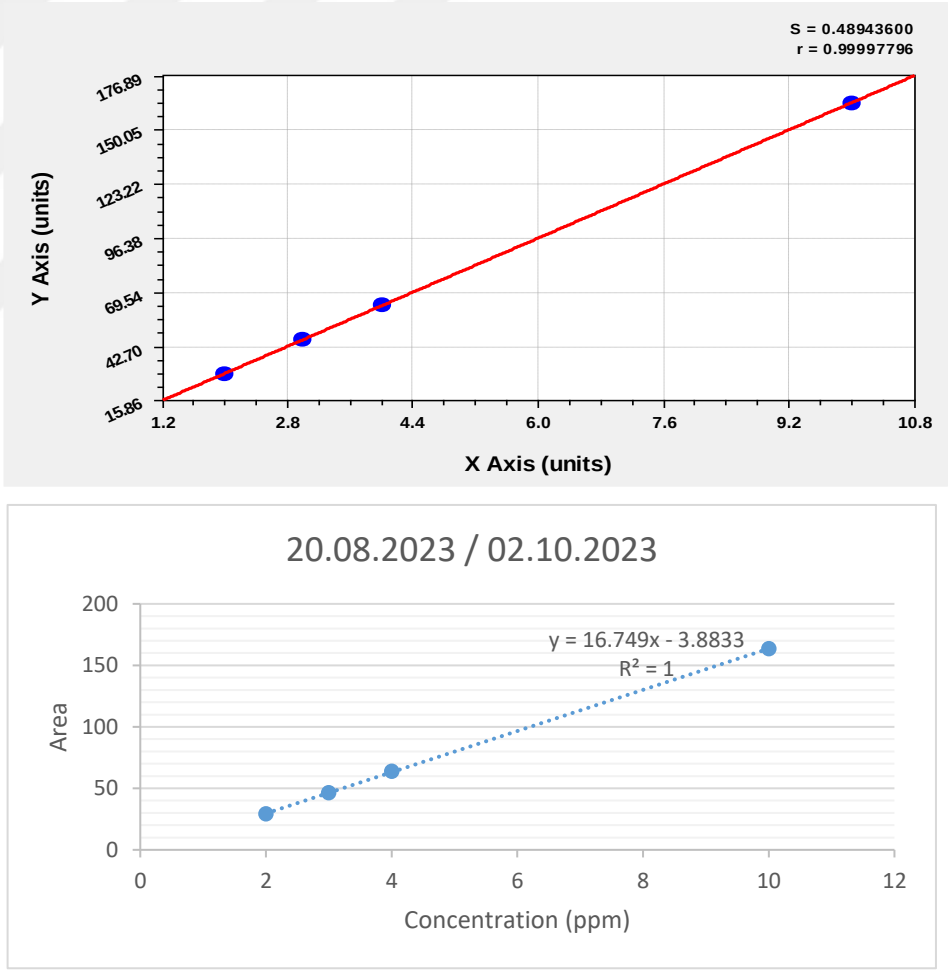


Figure 0.91. Calibration curves of *alpha*-Endosulfan in mixture II of mix B on August and October 2023

Table 0.194. Names of method for *beta*-Endosulfan in mixture II of mix B

***beta*-endosulfan in mixture II**	
Date	**Method**
8.05.2023	pestisitcalibration
10.06.2023	pestisitcal
19.06.2023	pestisitcal
26.06.2023	pestisitcal
3.07.2023	pestisitcal
21.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.195. Calculation of uncertainty of calibration curve for *beta*-Endosulfan in mixture II of mix B on May 2023

8.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	11
2	84.125	1.55	-4.20	17.64	**C_0 (ppm)**	8
3	137.516	2.53	-3.22	10.34	**C_{ort}**	5.8
8	410.535	7.56	1.81	3.29	**S**	1.011
10	517.331	9.53	3.78	14.30	**B_1**	54.27
$\bar{C}$=5.8			**S_{xx}**	11	**p**	1
					n	4
					u(C_0)	0.016

Table 0.196. Calculation of uncertainty of calibration curve for *beta*-Endosulfan in mixture II of mix B on June and July 2023

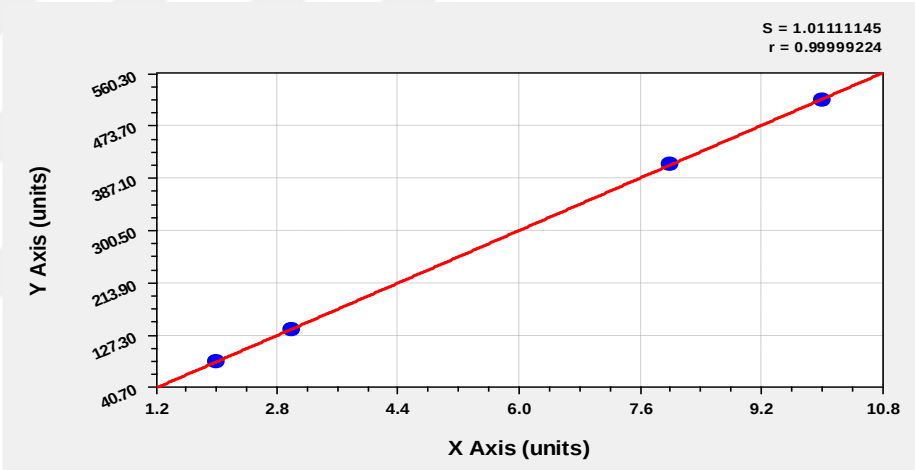
10.06.2023 / 19.06.2023 / 26.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	7.4
2	58.142	1.90	-4.30	18.47	**C_0 (ppm)**	6
5	148.959	4.87	-1.33	1.76	**C_{ort}**	6.2
6	178.558	5.84	-0.36	0.13	**S**	1.33
8	242.808	7.95	1.75	3.05	**B_1**	30.56
10	301.610	9.87	3.67	13.47	**p**	1
$\bar{C}$=6.2			**S_{xx}**	7.4	**n**	5
					$u(C_0)$	0.02

Table 0.197. Calculation of uncertainty of calibration curve for *beta*-Endosulfan in mixture II of mix B on August 2023

21.08.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	5.3
2	35.444	1.70	-2.55	6.50	**C_0 (ppm)**	4
3	55.365	2.65	-1.60	2.54	**C_{ort}**	6.3
4	76.824	3.68	-0.57	0.32	**S**	0.48
8	160.243	7.68	3.43	11.79	**B_1**	20.86
$\bar{C}$=6.3			**S_{xx}**	5.3	**p**	1
					n	4
					$u(C_0)$	0.025

Table 0.198. Calculation of uncertainty of calibration curve for *beta*-Endosulfan in mixture II of mix B on October 2023

02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10.1
2	40.297	1.72	-4.28	18.29	**C_0 (ppm)**	4
4	87.007	3.72	-2.28	5.19	**C_{ort}**	6.3
8	180.045	7.70	1.70	2.90	**S**	0.22
10	227.543	9.73	3.73	13.94	**B_1**	23.38
$\bar{C}$=6.3			**S_{xx}**	10.1	**p**	1
					n	4
					u(C_0)	0.008



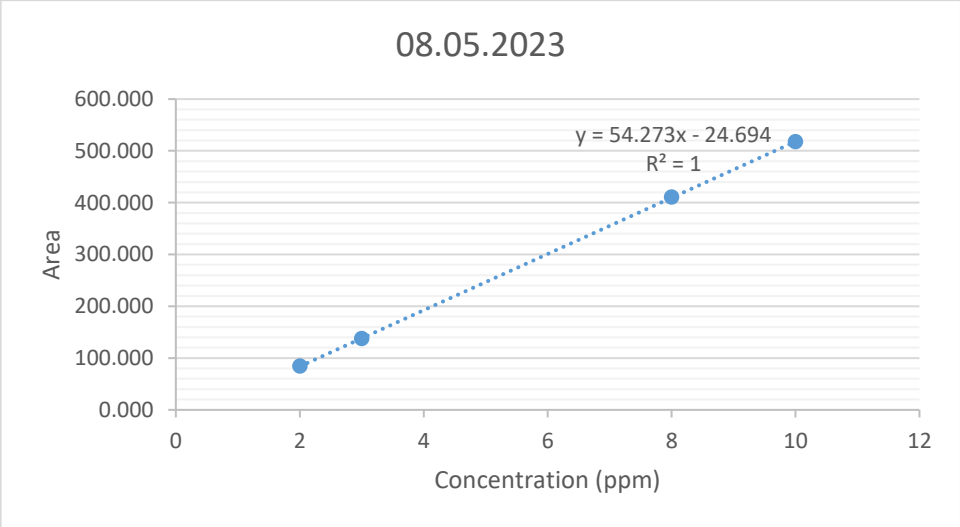
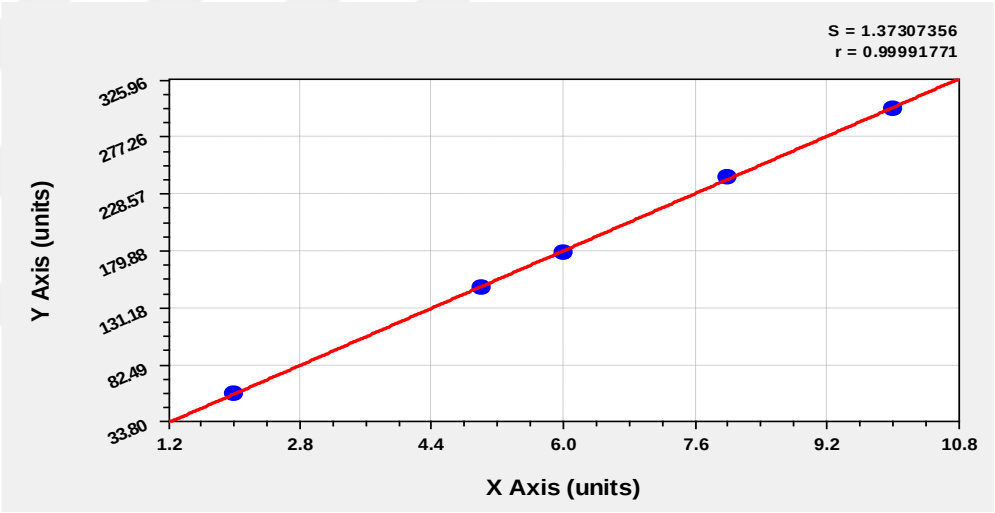


Figure 0.92. Calibration curves of *beta*-Endosulfan in mixture II of mix B on May 2023



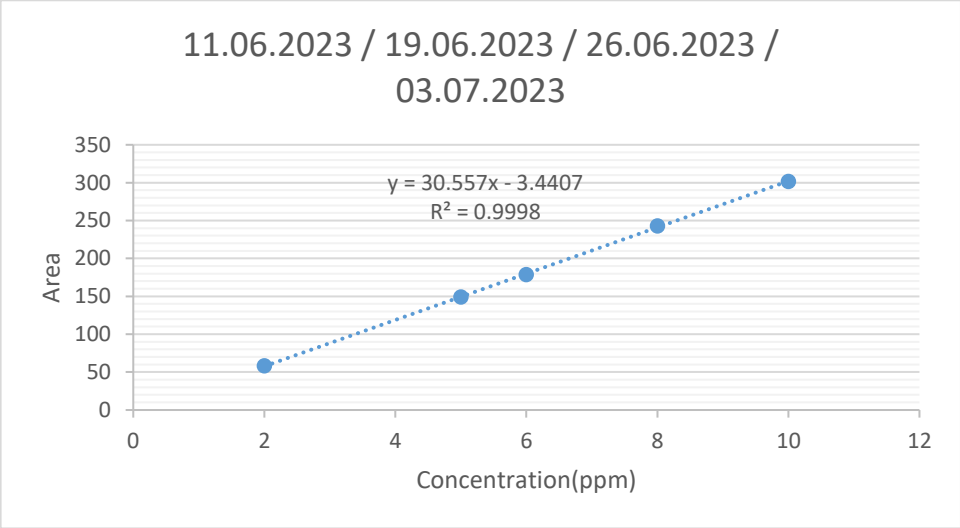
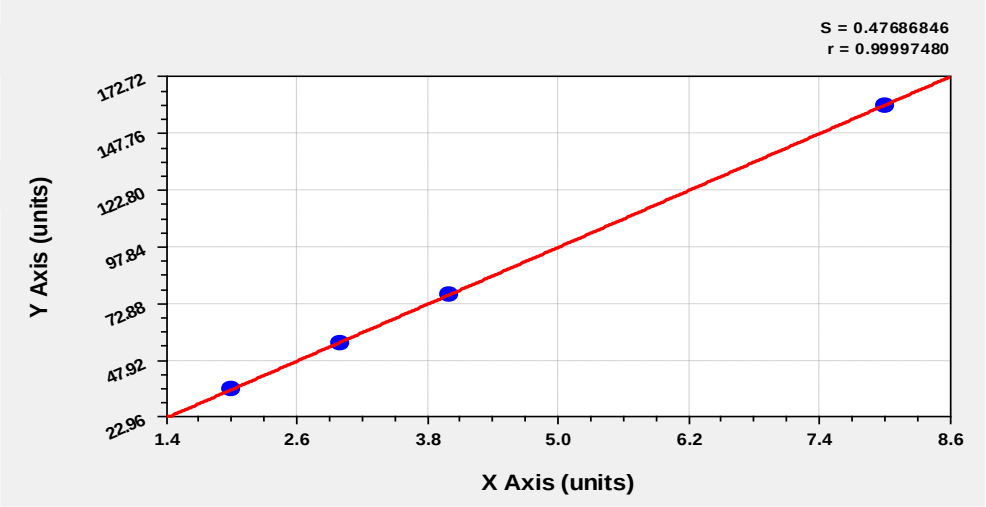


Figure 0.93. Calibration curves of *beta*-Endosulfan in mixture II of mix B on June and July 2023



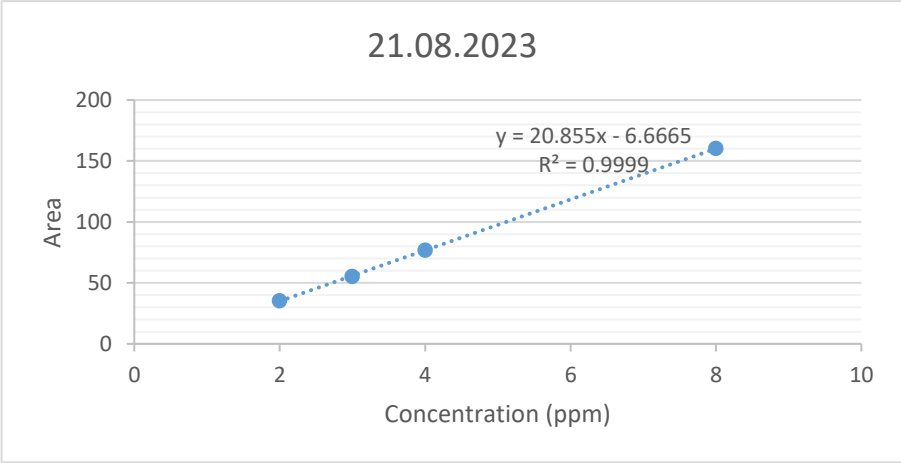
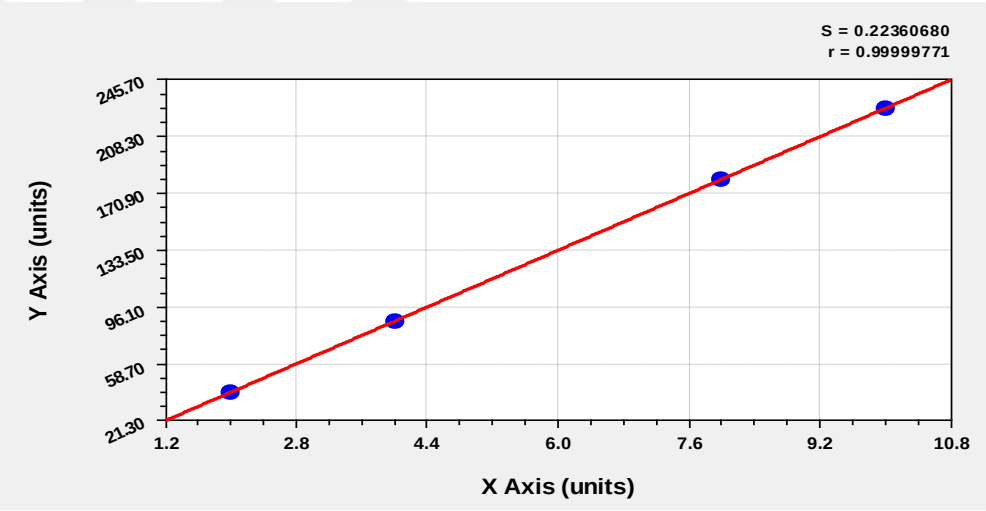


Figure 0.94. Calibration curves of *beta*-Endosulfan in mixture II of mix B on August 2023



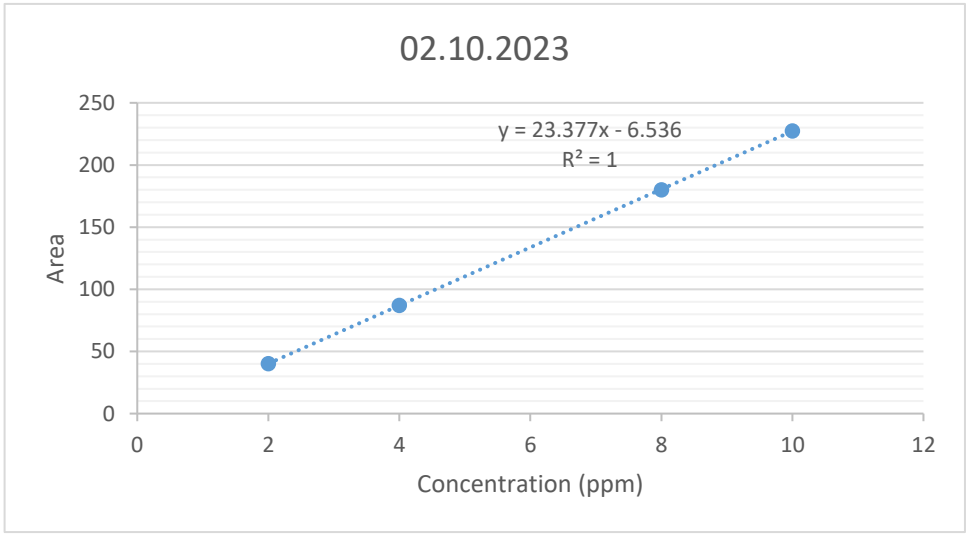


Figure 0.95. Calibration curves of *beta*-Endosulfan in mixture II of mix B on October 2023

Table 0.199. Names of method for Heptachlor in mixture II of mix B

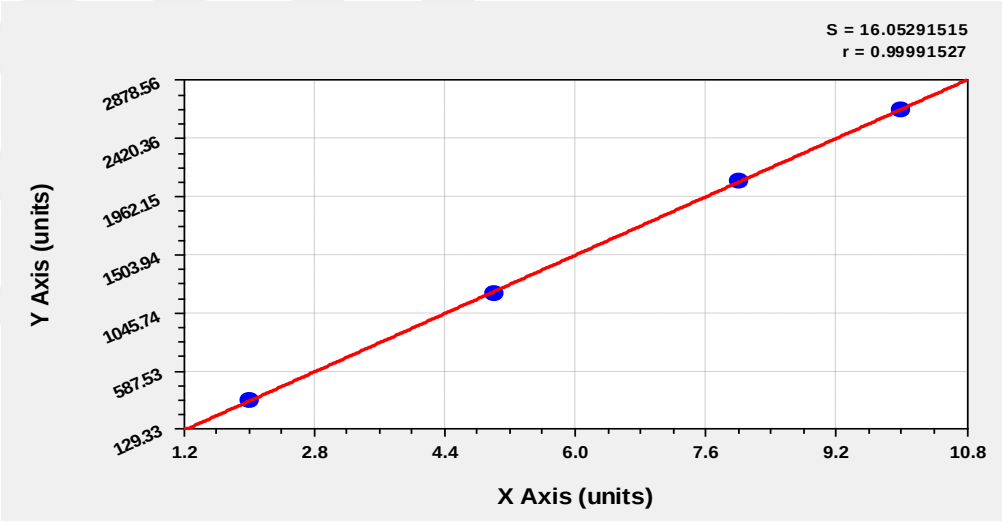
heptachlor in mixture II	
Date	**Method**
10.06.2023	pestisitcal
19.06.2023	pestisitcal
26.06.2023	pestisitcal
28.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.200. Calculation of uncertainty of calibration curve for Heptachlor in mixture II of mix B on June 2023

10.06.2023 / 19.06.2023 / 26.06.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10
2	358.431	1.25	-5.00	25.04	**C_0 (ppm)**	5
5	1,195.702	4.16	-2.09	4.38	**C_{ort}**	6.3
8	2,087.913	7.26	1.01	1.02	**S**	16.1
10	2,649.458	9.21	2.96	8.76	**B_1**	287.66
$\bar{C}$=6.3			**S_{xx}**	10	**p**	1
					n	4
					$u(C_0)$	0.04

Table 0.201. Calculation of uncertainty of calibration curve for Heptachlor in mixture II of mix B on August and October 2023

28.08.2023/ 02.10.023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	7.5
4	93.197	3.18	-3.82	14.62	**C_0 (ppm)**	6
6	151.414	5.16	-1.84	3.39	**C_{ort}**	7.0
8	211.725	7.22	0.22	0.05	**S**	0.957
10	268.725	9.16	2.16	4.65	**B_1**	29.35
$\bar{C}$=6.2			**S_{xx}**	7.5	**p**	1
					n	4
					$u(C_0)$	0.020



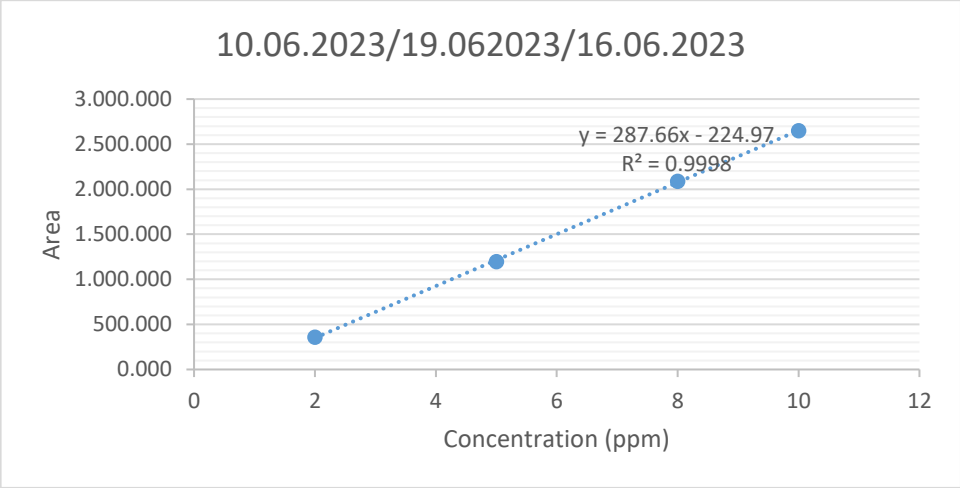
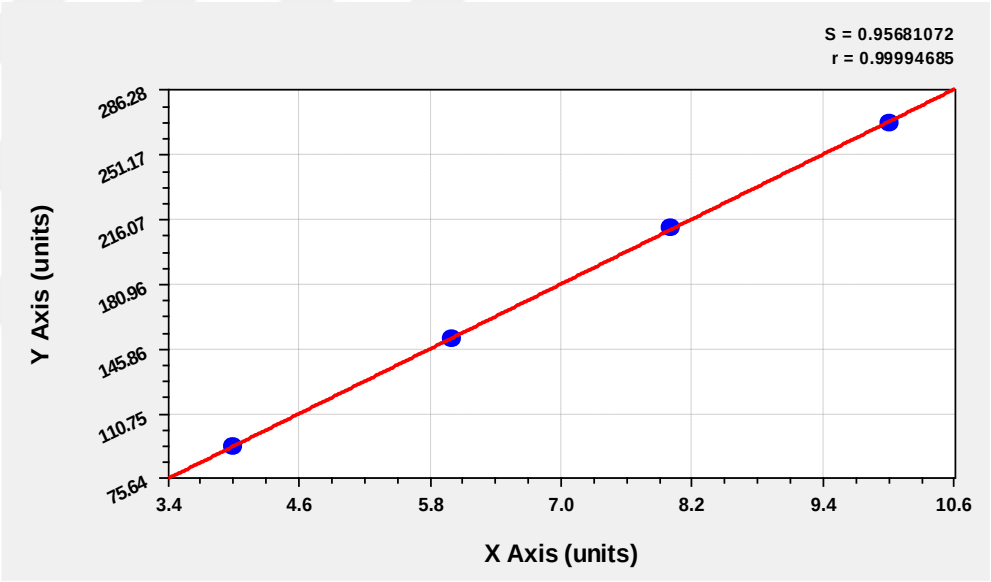


Figure 0.96. Calibration curves of Heptachlor in mixture II of mix B on June 2023



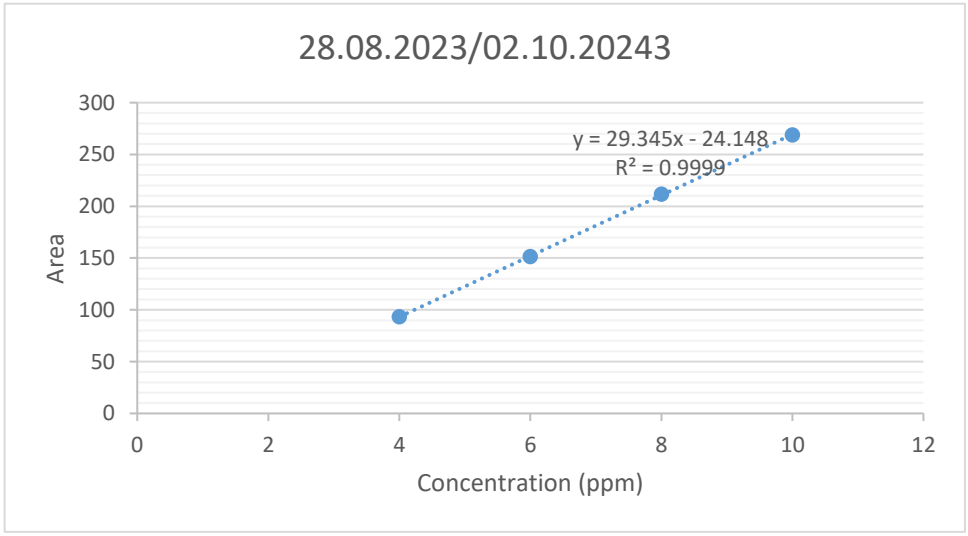


Figure 0.97. Calibration curves of Heptachlor in mixture II of mix B on August and October 2023

Table 0.202. Names of method for Heptachlor-*endo*-epoxide in mixture II of mix B

heptachlor-*endo*-epoxide in mixture II	
Date	**Method**
9.05.2023	pestisitcalibration
11.06.2023	pestisitcal
19.06.2023	pestisitcal
26.06.2023	pestisitcal
3.07.2023	pestisitcal
28.08.2023	Pestisitcalmix102
2.10.2023	Pestisitcalmix102

Table 0.203. Calculation of uncertainty of calibration curve for Heptachlor-*endo*-epoxide in mixture II of mix B on May, June and July 2023

09.05.2023 / 11.06.2023 / 19.06.2023 / 26.06.2023 / 03.07 2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	7
2	106.680	1.75	-4.45	19.81	**C_0 (ppm)**	6
5	293.979	4.82	-1.38	1.91	**C_{ort}**	6.2
6	349.525	5.73	-0.47	0.22	**S**	2.56
8	475.283	7.79	1.59	2.53	**B_1**	61.01
10	594.820	9.75	3.55	12.60	**p**	1
$\bar{C}$=6.8			**S_{xx}**	7.4	**n**	5
					$u(C_0)$	0.019

Table 0.204. Calculation of uncertainty of calibration curve for Heptachlor-*endo*-epoxide in mixture II of mix B on August and October 2023

28.08.2023/02.10.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	9.8
2	50.408	1.76	-2.99	8.96	**C_0 (ppm)**	4
3	79.082	2.75	-2.00	3.98	**C_{ort}**	6.8
4	106.856	3.72	-1.03	1.06	**S**	0.56
10	279.899	9.75	5.00	25.01	**B_1**	28.71
$\bar{C}$=6.8			**S_{xx}**	9.8	**p**	1
					n	4
					u(C_0)	0.020

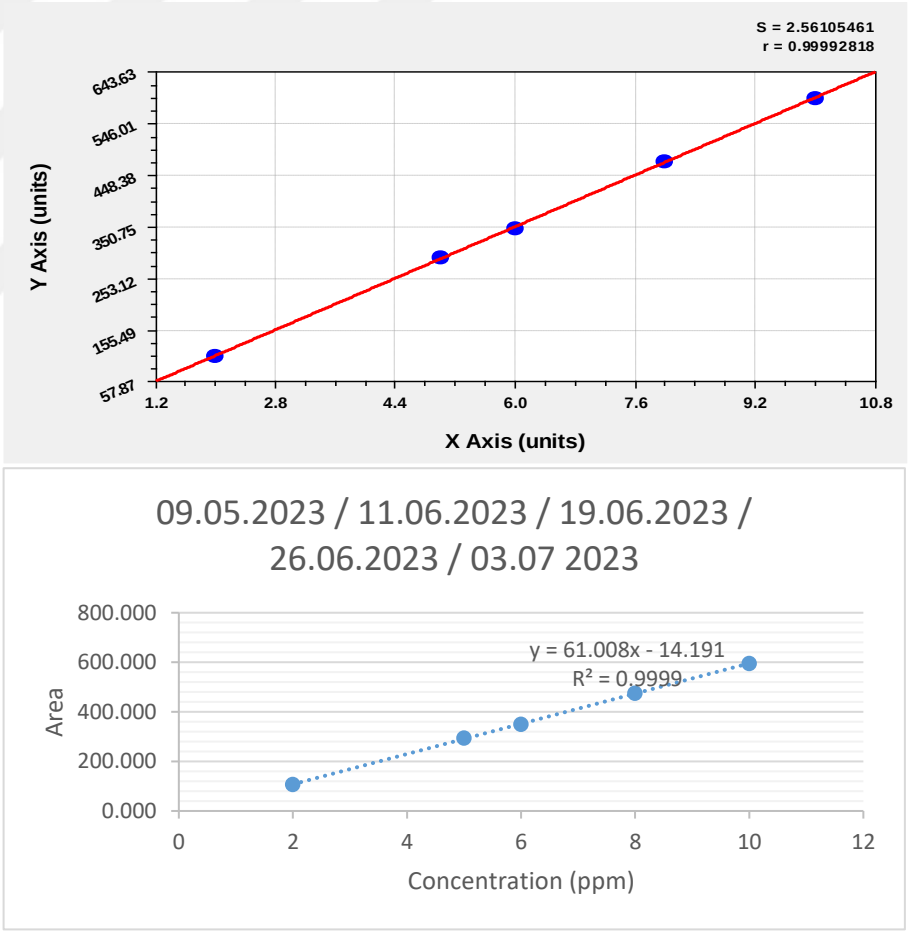
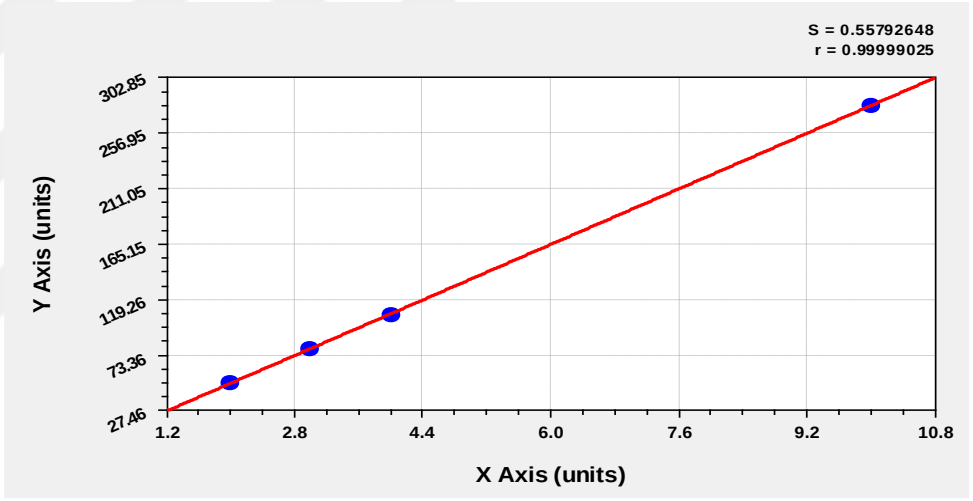


Figure 0.98. Calibration curves of Heptachlor-*endo*-epoxide in mixture II of mix B on May, June and July 2023



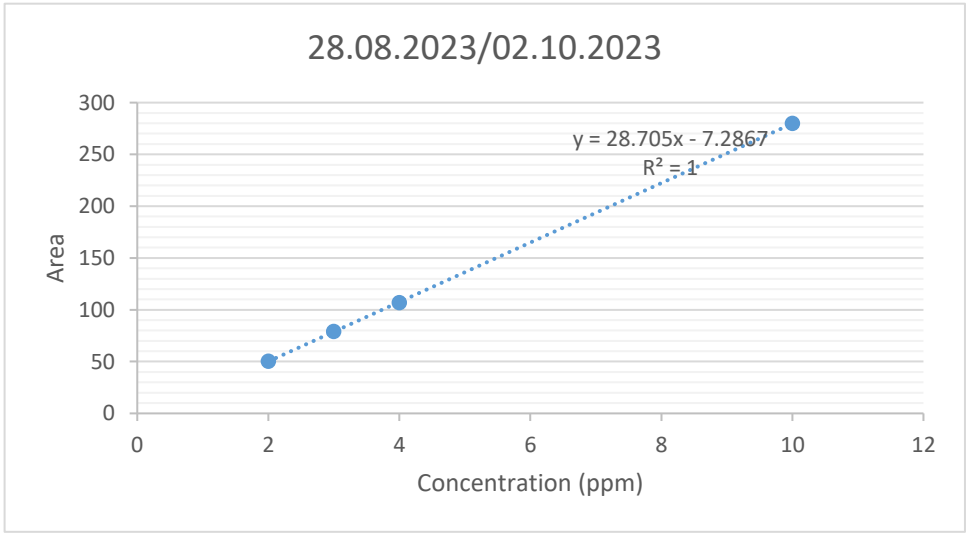


Figure 0.99. Calibration curves of Heptachlor-*endo*-epoxide in mixture II of mix B on August and October 2023

Table 0.205. Names of method for *alpha*-HCH in mixture II of mix C

***alpha*-HCH in mixture II**	
Date	**Method**
9.12.2022	pestisitsimcal4
15.12.2022	pestisitsimcal4
19.12.2022	pestisitsimcal419122022

Table 0.206. Calculation of uncertainty of calibration curve for *alpha*-HCH in mixture II of mix C on December 2022

09.12.2022/15.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	12
0.5	500	0.4	-3.4	11.5	**C0 (ppm)**	2.5
1	1065	0.9	-2.9	8.6	**Cort**	3.8
2.5	3002	2.5	-1.3	1.8	**S**	47.5
5	5959	4.9	1.1	1.2	**B1**	1219.7
10	12086	9.9	6.1	37.3	**p**	1
$\bar{C}$=3.8			**S_{xx}**	12	**n**	5
					$u(C_0)$	0.023

Table 0.207. Calculation of uncertainty of calibration curve for *alpha*-HCH in mixture II of mix C on December 2022

19.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10
2.5	3041	2.1	-3.8	14.2	**C_0 (ppm)**	5
5	6797	4.6	-1.2	1.5	**C_{ort}**	5.8
10	14122	9.6	3.7	14.0	**S**	49.98
$\bar{C}$=5.8			**S_{xx}**	10	**B_1**	1475.7
					p	1
					n	3
					$u(C_0)$	0.022

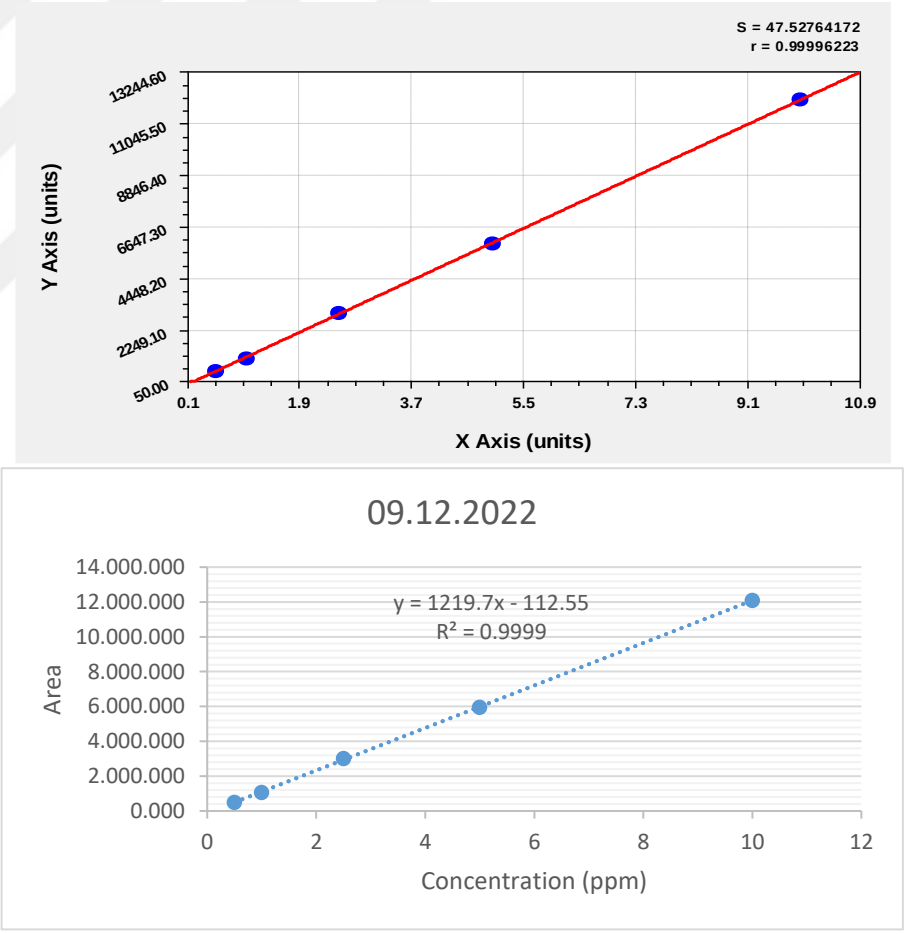
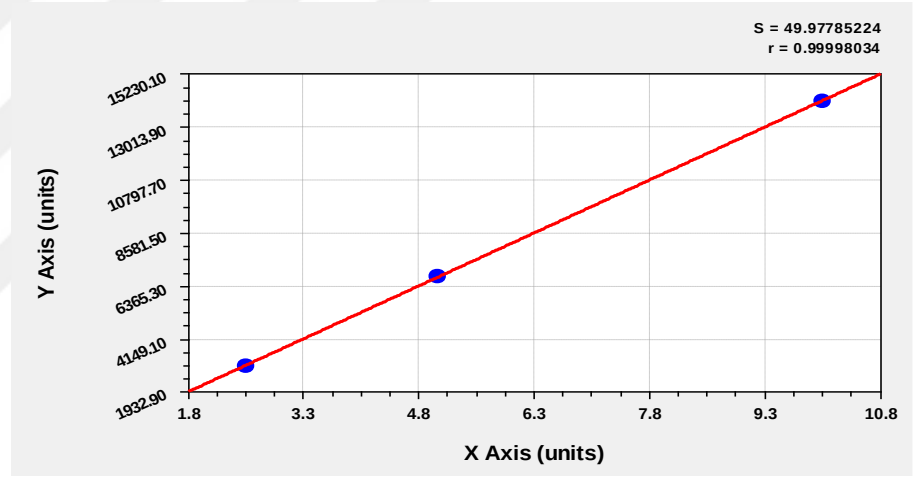


Figure 0.100. Calibration curves of *alpha*-HCH in mixture II of mix C on December 2022



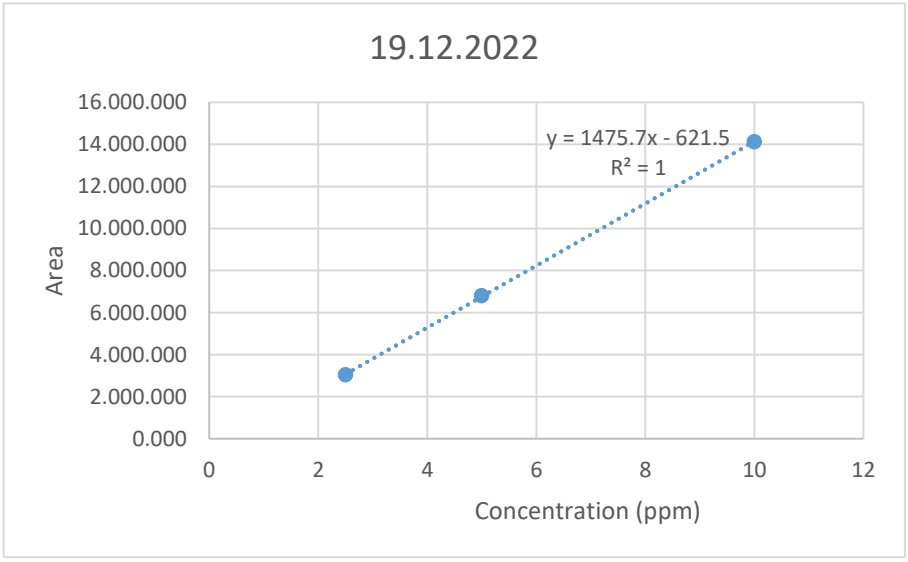


Figure 0.101. Calibration curves of *alpha*-HCH in mixture II of mix C on December 2022

Table 0.208. Names of method for *gamma*-HCH in mixture II of mix C

***gamma*-HCH in mixture II**	
Date	**Method**
9.12.2022	pestisitsimcal4
15.12.2022	pestisitsimcal4
19.12.2022	pestisitsimcal419122022

Table 0.209. Calculation of uncertainty of calibration curve for *gamma*-HCH in mixture II of mix C on December 2022

09.12.2022/15.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	12
0.5	499	0.38	-3.42	11.69	**C_0 (ppm)**	2.5
1	1153	0.88	-2.92	8.53	**C_{ort}**	3.8
2.5	3115	2.38	-1.42	2.03	**S**	54.4
5	6497	4.95	1.15	1.33	**B_1**	1311.5
10	12937	9.86	6.06	36.78	**p**	1
$\bar{C}$=3.8			**S_{xx}**	12	**n**	5
					$u(C_0)$	0.024

Table 0.210. Calculation of uncertainty of calibration curve for *gamma*-HCH in mixture II of mix C on December 2022

19.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	10
1	1240	0.8	-3.85	14.85	**C_0 (ppm)**	5
2.5	3476	2.2	-2.46	6.06	**C_{ort}**	4.6
5	7608	4.7	0.11	0.01	**S**	89.1
10	15639	9.7	5.11	26.07	**B_1**	1607.1
$\bar{C}$=4.6			**S_{xx}**	10	**p**	1
					n	4
					u(C_0)	0.028

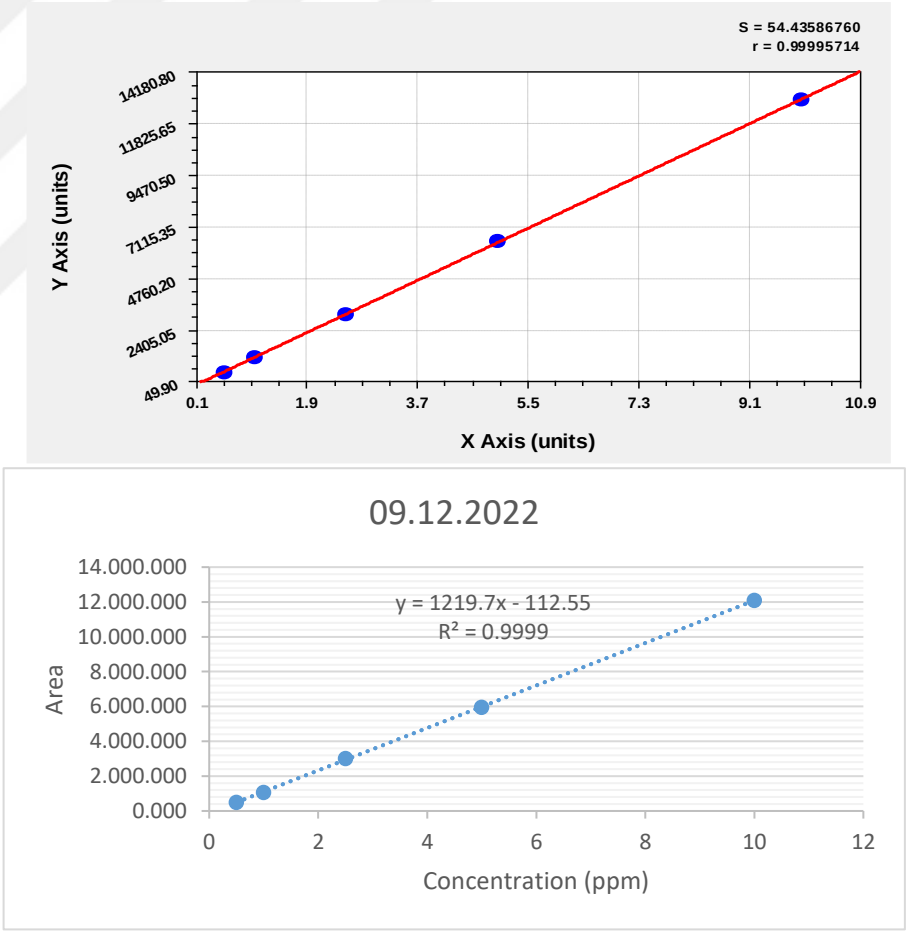


Figure 0.102. Calibration curves of *gamma*-HCH in mixture II of mix C on December 2022

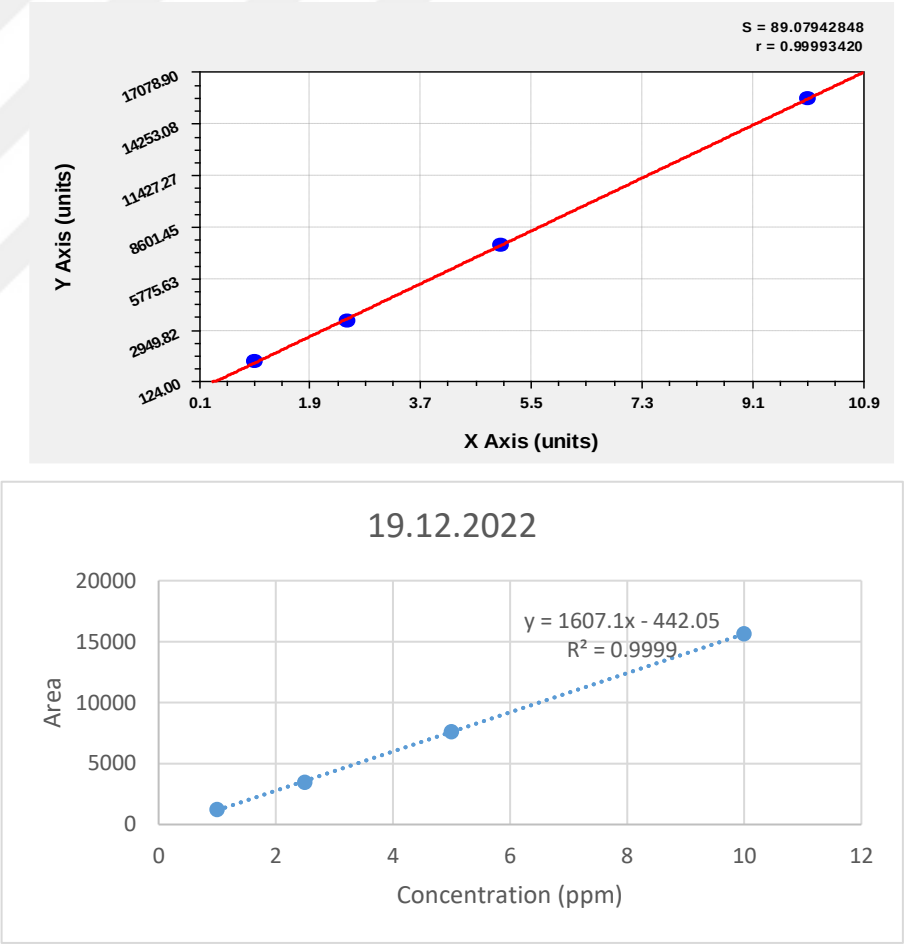


Figure 0.103. Calibration curves of *gamma*-HCH in mixture II of mix C on December 2022

Table 0.211. Names of method for Aldrin in mixture II of mix C

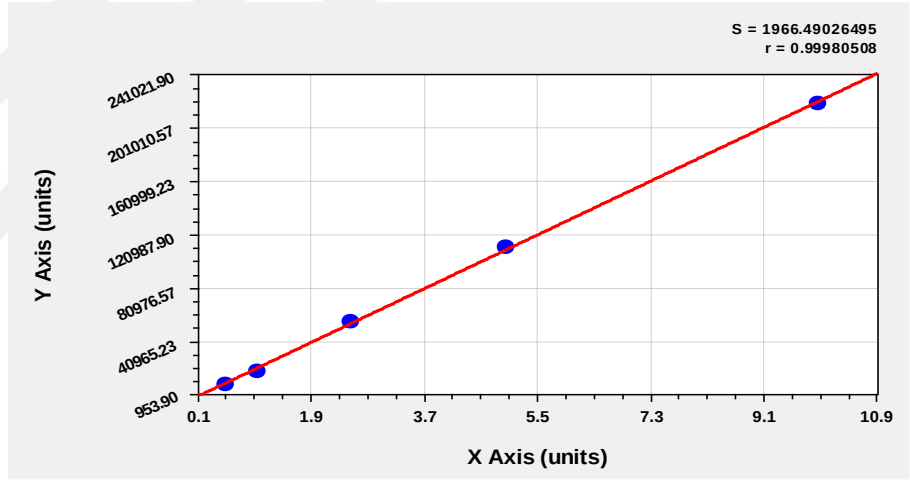
aldrin in mixture II	
Date	**Method**
9.12.2022	pestisitsimcal4
15.12.2022	pestisitsimcal4
19.12.2022	pestisitsimcal419122022

Table 0.212. Calculation of uncertainty of calibration curve for Aldrin in mixture II of mix C on December 2022

09.12.2022/15.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	12
0.5	9539	0.43	-3.37	11.36	**C_0 (ppm)**	2.5
1	19319	0.87	-2.93	8.59	**C_{ort}**	3.8
2.5	56286	2.53	-1.27	1.60	**S**	1966.5
5	111879	5.04	1.24	1.53	**B_1**	22212
10	219978	9.90	6.10	37.25	**p**	1
$\bar{C}$=3.8			**S_{xx}**	12	**n**	5
					$u(C_0)$	0.052

Table 0.213. Calculation of uncertainty of calibration curve for Aldrin in mixture II of mix C on December 2022

19.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	15
0.5	10244	0.4	-3.7	14.0	**C_0 (ppm)**	5
1	21402	0.8	-3.3	11.0	**C_{ort}**	4.1
5	129111	4.9	0.8	0.6	**S**	1165.6
10	260471	9.8	5.7	32.7	**B_1**	26453
$\bar{C}$=4.1			**S_{xx}**	15	**p**	1
					n	4
					u(C_0)	0.024



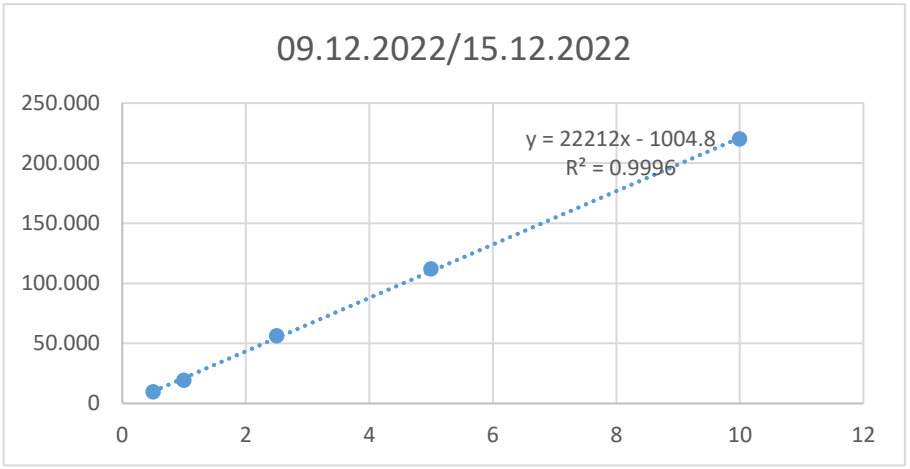


Figure 0.104. Calibration curves of Aldrin in mixture II of mix C on December 2022

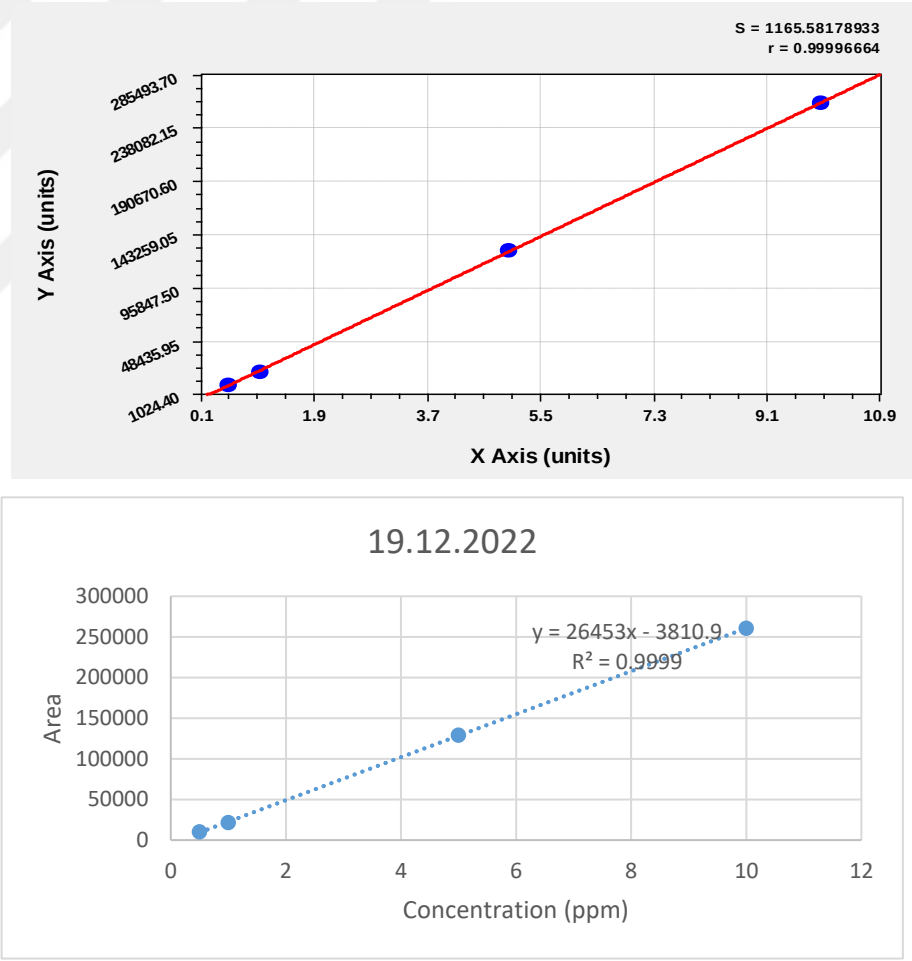


Figure 0.105. Calibration curves of Aldrin in mixture II of mix mix C on December 2022

Table 0.214. Names of method for Dieldrin in mixture II of mix C

dieldrin in mixture II	
Date	**Method**
9.12.2022	pestisitsimcal4
15.12.2022	pestisitsimcal4
19.12.2022	pestisitsimcal419122022

Table 0.215. Calculation of uncertainty of calibration curve for Dieldrin in mixture II of mix C on December 2022

8.05.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	12
1	21303	0.6	-4.03	16.24	**C_0 (ppm)**	5
2.5	70458	2.0	-2.66	7.06	**C_{ort}**	46
5	160886	4.5	-0.13	0.02	**S**	2514.6
10	342001	9.6	4.93	24.27	**B_1**	35805
$\bar{C}$=5.8			**S_{xx}**	12	**p**	1
					n	4
					$u(C_0)$	0.036

Table 0.216. Calculation of uncertainty of calibration curve for Dieldrin in mixture II of mix C on December 2022

19.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	11
1	25644	0.6	-4.04	16.29	**C_0 (ppm)**	5
2.5	78478	1.8	-2.82	7.98	**C_{ort}**	4.6
5	191207	4.4	-0.24	0.06	**S**	6646.5
10	413510	9.5	4.86	23.66	**B_1**	43579
$\bar{C}$=4.6			**S_{xx}**	11	**p**	1
					n	4
					$u(C_0)$	0.078

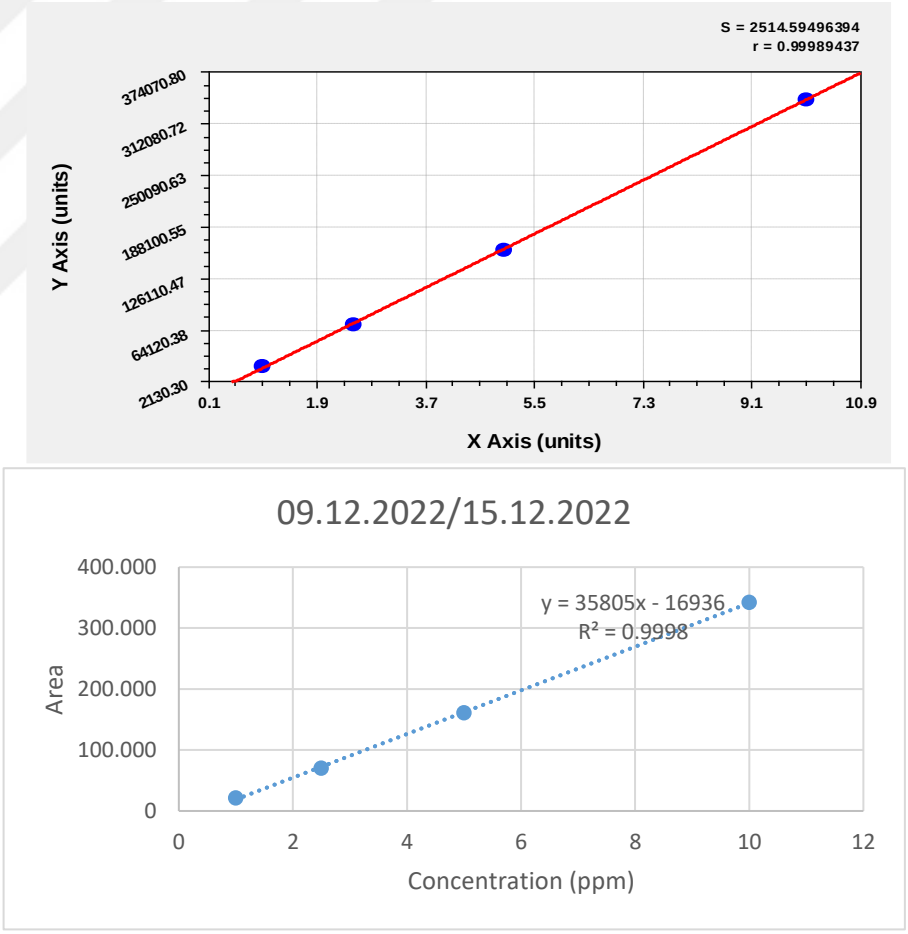


Figure 0.106. Calibration curves of Dieldrin in mixture II of mix C on December 2022

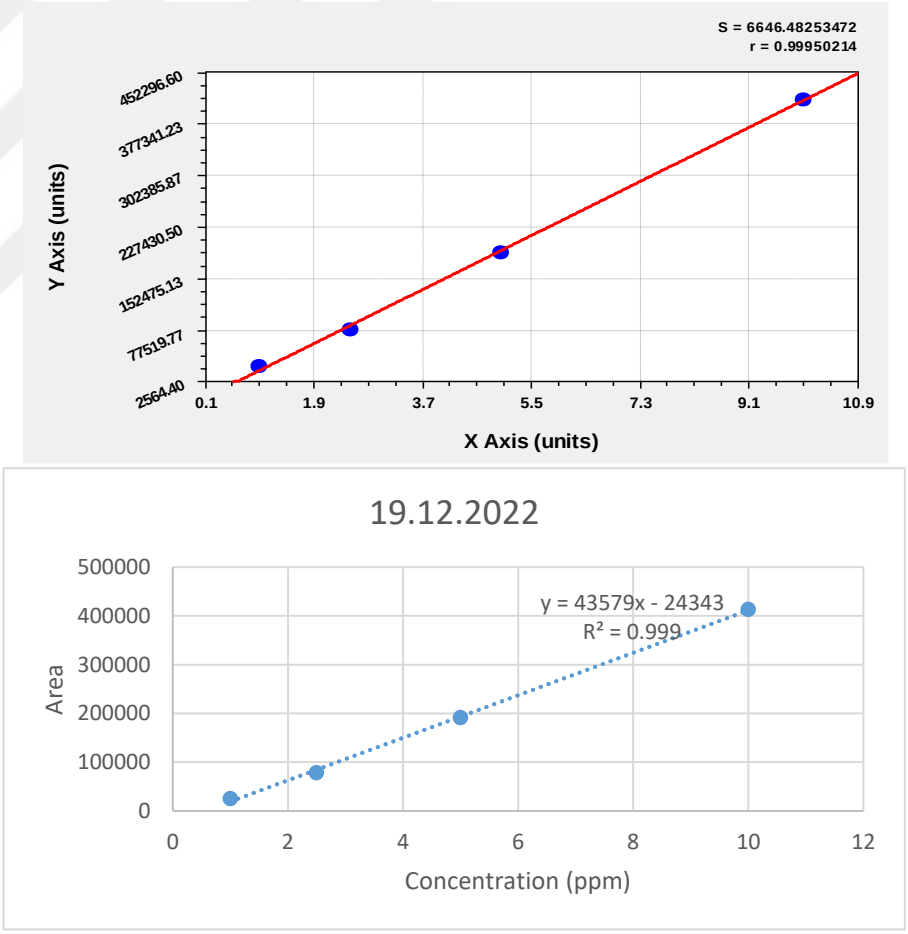


Figure 0.107. Calibration curves of Dieldrin in mixture II of mix C on December 2022

Table 0.217. Names of method for Endrin in mixture II of mix C

endrin in mixture II	
Date	**Method**
9.12.2022	pestisitsimcal4
15.12.2022	pestisitsimcal4
19.12.2022	pestisitsimcal419122022

Table 0.218. Calculation of uncertainty of calibration curve for Endrin in mixture II of mix C on December 2022

09.12.2022/15.12.2022						
Conc (ppm)	**Area**	C_i	$C_i - C_{ort}$	$(C_i - C_{av})^2$	S_{xx}	15
0.5	11154	0.4	-3.11	9.67	C_0 (ppm)	2.5
1	25104	0.9	-2.62	6.87	C_{ort}	3.5
2.5	72642	2.5	-0.96	0.91	S	2677.04
10	282937	9.9	6.41	41.09	B_1	28551
$\bar{C}$=3.5			S_{xx}	15	p	1
					n	4
					$u(C_0)$	0.053

Table 0.219. Calculation of uncertainty of calibration curve for Endrin in mixture II of mix C on December 2022

19.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	11
2.5	12735	1.4	-4.39	19.30	**C_0 (ppm)**	5
5	34351	3.9	-1.95	3.80	**C_{ort}**	5.8
10	78952	8.9	3.10	9.58	**S**	365.9
$\bar{C}$=5.8			**S_{xx}**	11	**B_1**	8842
					p	1
					n	3
					$u(C_0)$	0.026

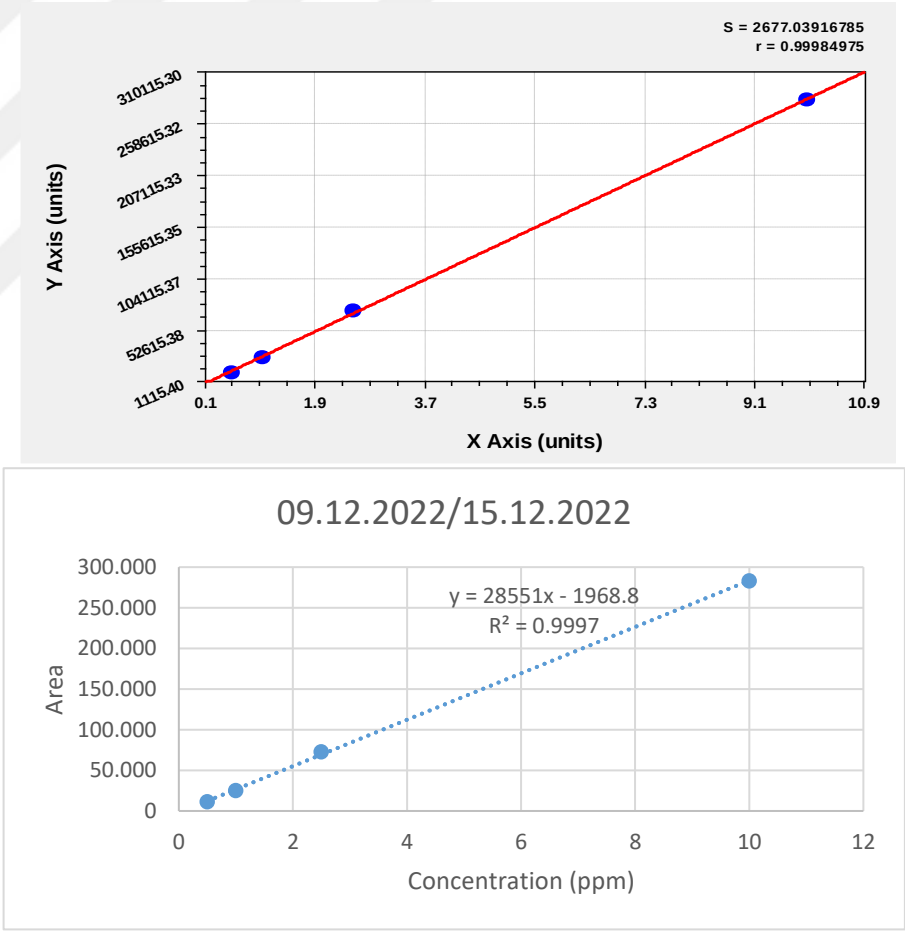
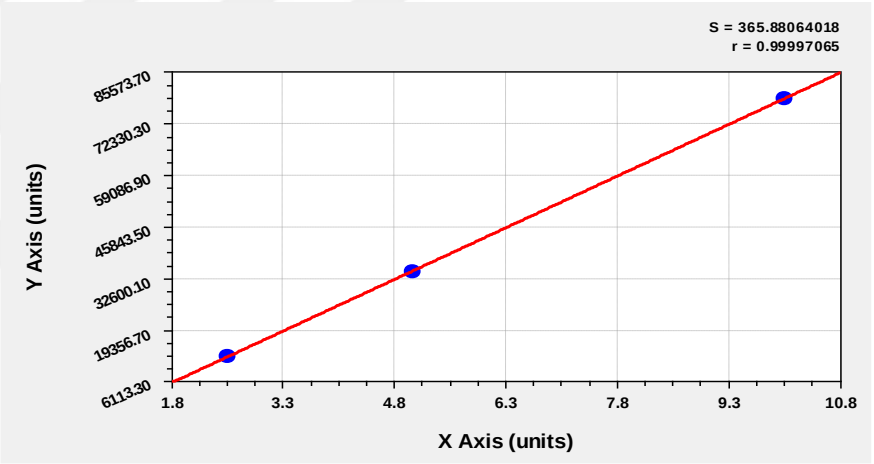


Figure 0.108. Calibration curves of Endrin in mixture II of mix C on December 2022



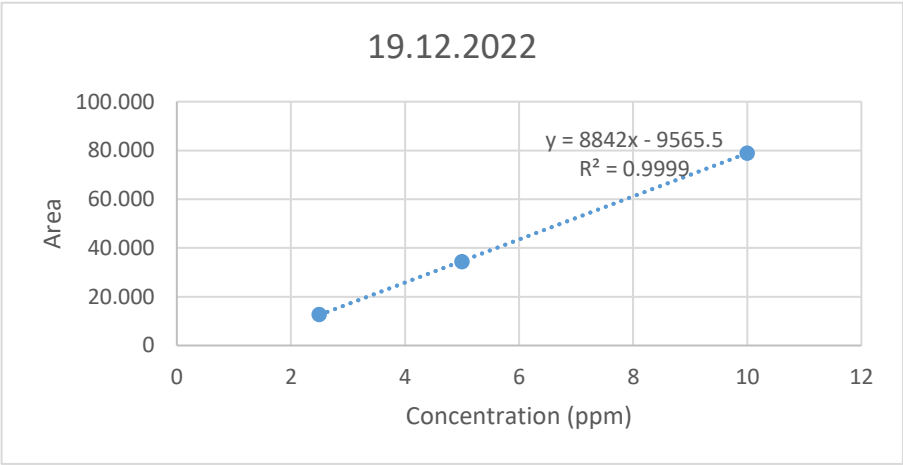


Figure 0.109. Calibration curves of Endrin in mixture II of mix C on December 2022

Table 0.220. Names of method for 4,4'-DDD in mixture II of mix C

4,4'-DDD in mixture II	
Date	**Method**
9.12.2022	pestisitsimcal4
15.12.2022	pestisitsimcal4
19.12.2022	pestisitsimcal419122022

Table 0.221. Calculation of uncertainty of calibration curve for 4,4'-DDD in mixture II of mix C on December 2022

09.12.2022/15.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	12
1	1.104	0.6	-4.01	16.10	**C_0 (ppm)**	5
2.5	45005	2.3	-2.35	5.52	**C_{ort}**	4.6
5	94884	4.8	0.17	0.030	**S**	216.6
10	191075	9.7	5.04	25.39	**B_1**	14841
$\bar{C}$=4.6			**S_{xx}**	12	**p**	1
					n	4
					$u(C_0)$	0.007

Table 0.222. Calculation of uncertainty of calibration curve for 4,4'-DDD in mixture II of mix C on December 2022

11.06.2023 / 18.06.2023 / 25.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	12
0.5	4827	0.2	-3.59	12.91	**C_0 (ppm)**	2.5
1	13610	0.6	-3.22	10.34	**C_{ort}**	3.8
2.5	45181	1.9	-1.86	3.46	**S**	2625.9
5	107702	4.6	0.82	0.67	**B_1**	23306
10	224009	9.6	5.81	33.78	**p**	1
$\bar{C}$=3.8			**S_{xx}**	12	**n**	5
					$u(C_0)$	0.066

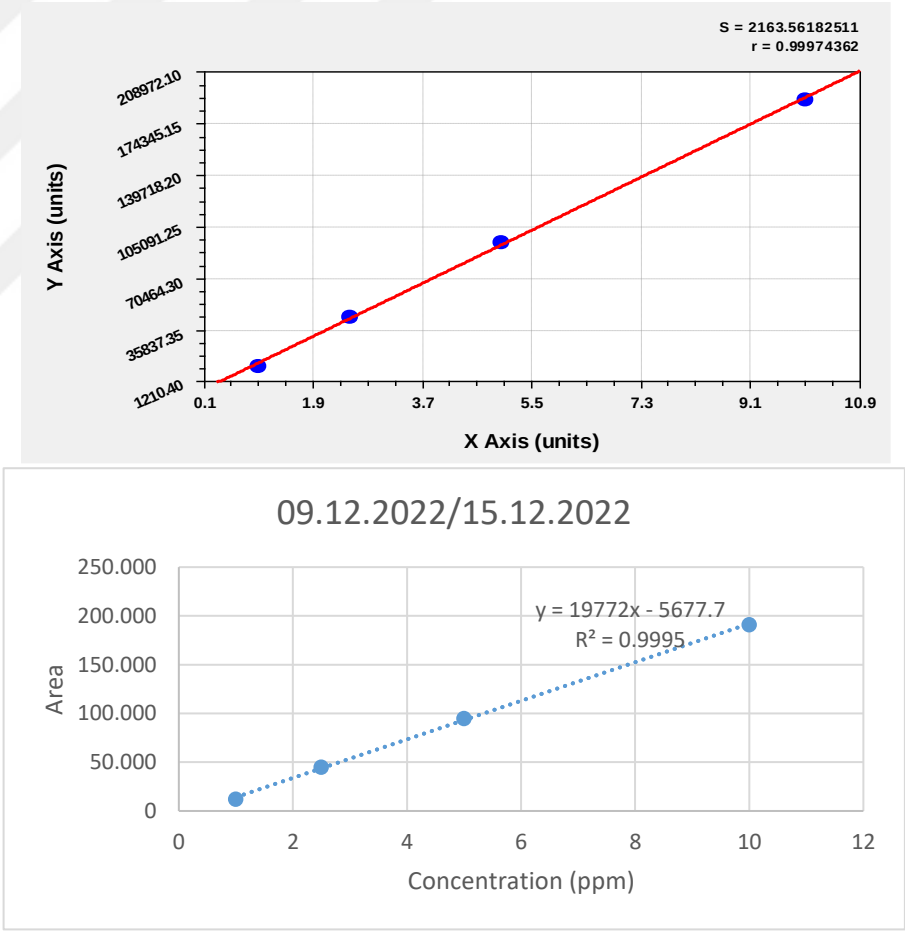


Figure 0.110. Calibration curves of 4,4’-DDD in mixture II of mix C on December 2022

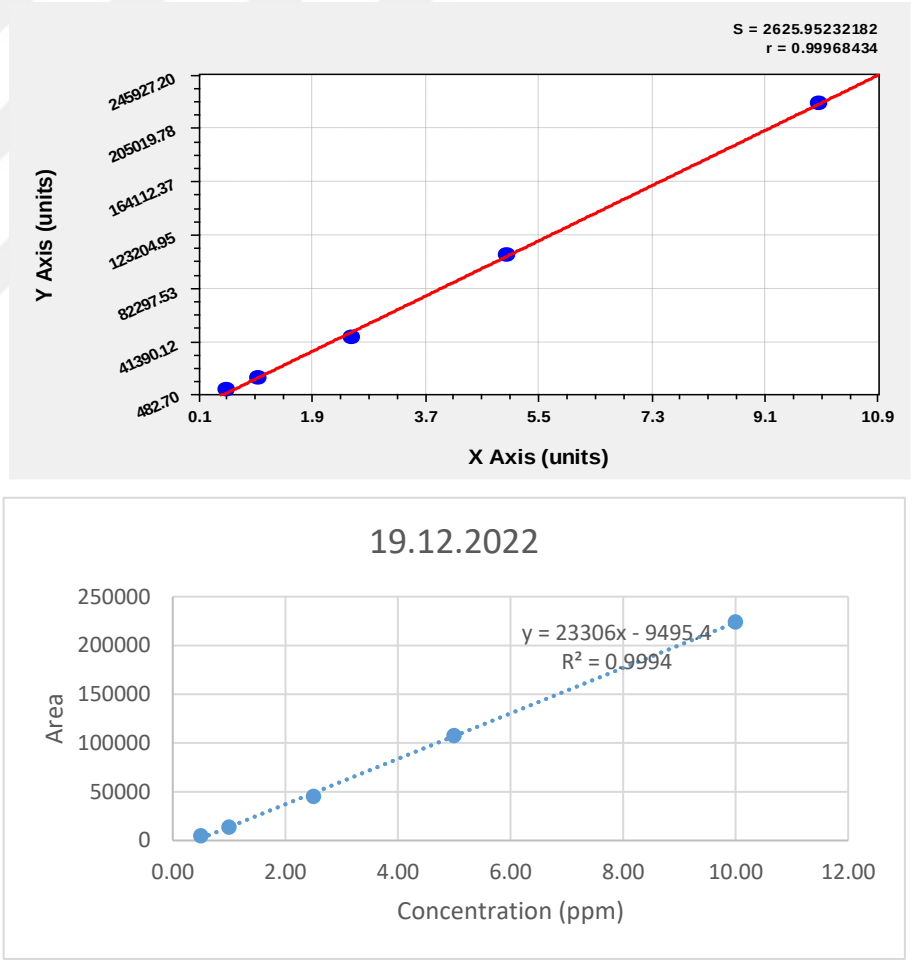


Figure 0.111. Calibration curves of 4,4'-DDD in mixture II of mix C on December 2022

Table 0.223. Names of method for 4,4’-DDT in mixture II of mix C

4,4’-DDT in mixture II	
Date	**Method**
9.12.2022	pestisitsimcal4
15.12.2022	pestisitsimcal4
19.12.2022	pestisitsimcal419122022

Table 0.224. Calculation of uncertainty of calibration curve for 4,4’-DDT in mixture II of mix C on December 2022

09.12.2022/15.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	11
2.5	22563	16	-4.27	18.25	**C_0 (ppm)**	5
5	57100	39	-1.88	3.55	**C_{ort}**	5.8
10	130680	90	3.20	10.27	**S**	1204.3
$\overline{C}$=5.8			**S_{xx}**	11	**B_1**	14459
					p	1
					n	3
					$u(C_0)$	0.053

Table 0.225. Calculation of uncertainty of calibration curve for 4,4'-DDT in mixture II of mix C on December 2022

19.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	11
2.5	30510	1.6	-4.23	17.90	**C_0 (ppm)**	5.0
5	78241	4.1	-1.72	2.97	**C_{ort}**	5.8
10	173301	9.1	3.27	10.70	**S**	107.4
$\bar{C}$=5.8			**S_{xx}**	11	**B_1**	19035
					p	1
					n	3
					$u(C_0)$	0.004

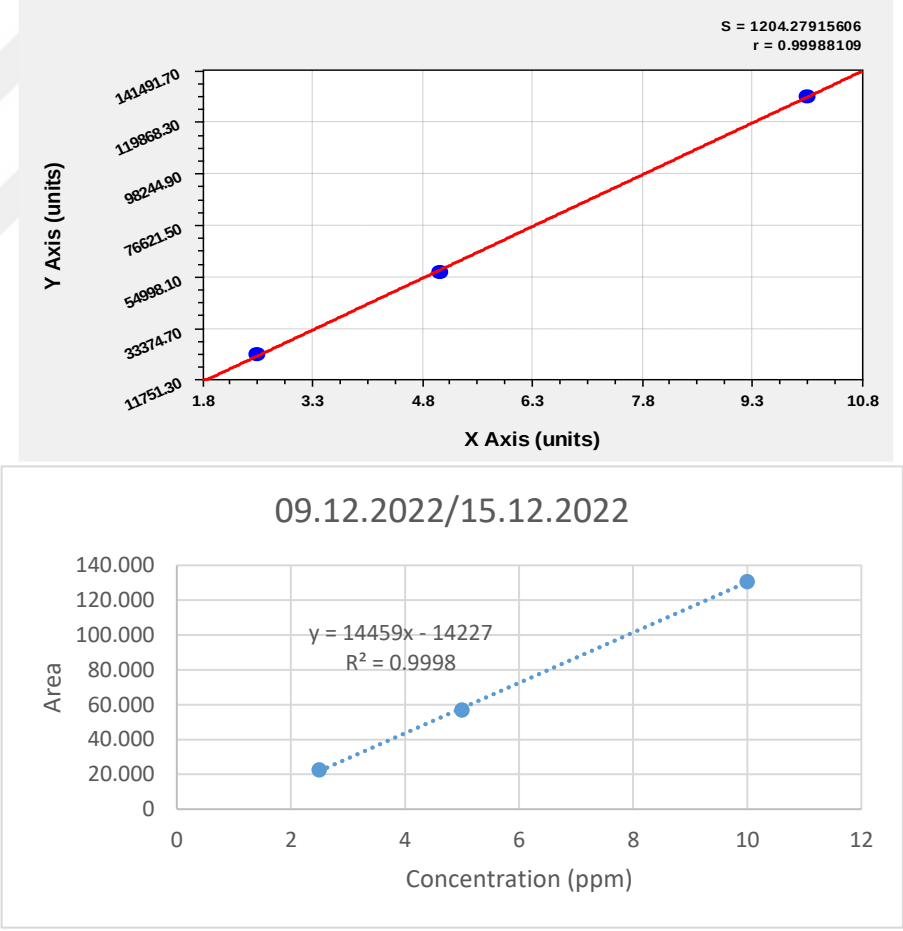


Figure 0.112. Calibration curves of 4,4’-DDT in mixture II of mix C on December 2022

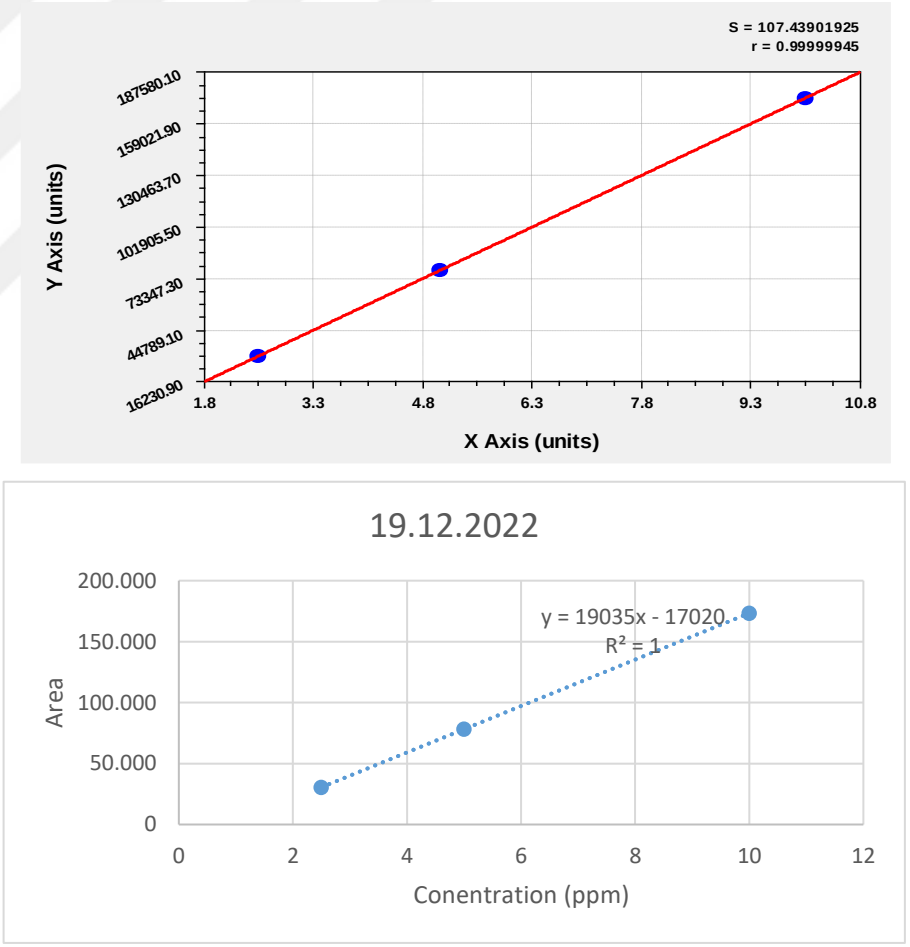


Figure 0.113. Calibration curves of 4,4'-DDT in mixture II of mix C on December 2022

Table 0.226. Names of method for 2,4'-DDT in mixture II of mix C

2,4'-DDT in mixture II	
Date	**Method**
9.12.2022	pestisitsimcal4
15.12.2022	pestisitsimcal4
19.12.2022	pestisitsimcal419122022

Table 0.227. Calculation of uncertainty of calibration curve for 2,4'-DDT in mixture II of mix C on December 2022

09.12.2022/15.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	12
1	4974	0.4	-4.18	17.51	**C_0 (ppm)**	5
2.5	20537	1.8	-2.80	7.87	**C_{ort}**	4.6
5	47759	4.2	-0.39	0.15	**S**	1294.1
10	106158	9.4	4.78	22.88	**B_1**	14841
$\bar{C}$=6.5			**S_{xx}**	10	**p**	1
					n	4
					$u(C_0)$	0.045

Table 0.228. Calculation of uncertainty of calibration curve for 2,4'-DDT in mixture II of mix C on December 2022

19.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	14
1	7046	0.5	-4.86	23.63	**C_0 (ppm)**	5
5	66082	4.4	-0.91	0.82	**C_{ort}**	5.3
10	141336	9.5	4.14	17.10	**S**	528.4
$\bar{C}$=5.3			**S_{xx}**	14	**B_1**	14926
					p	1
					n	3
					$u(C_0)$	0.021

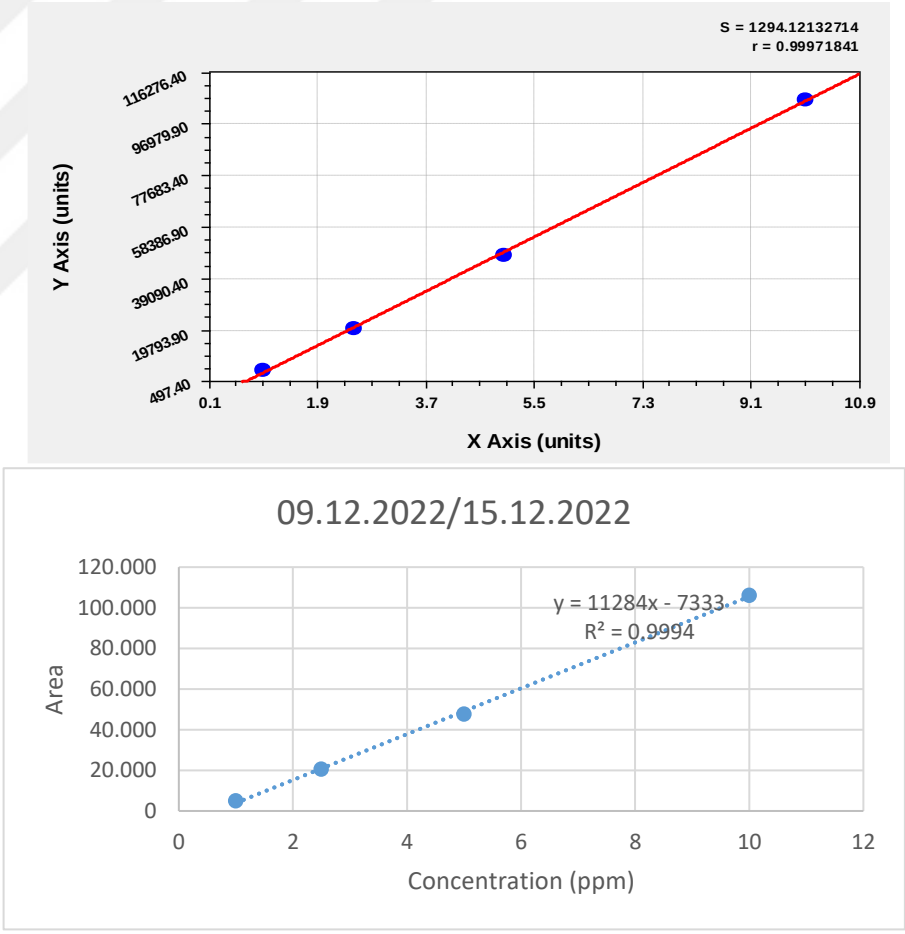
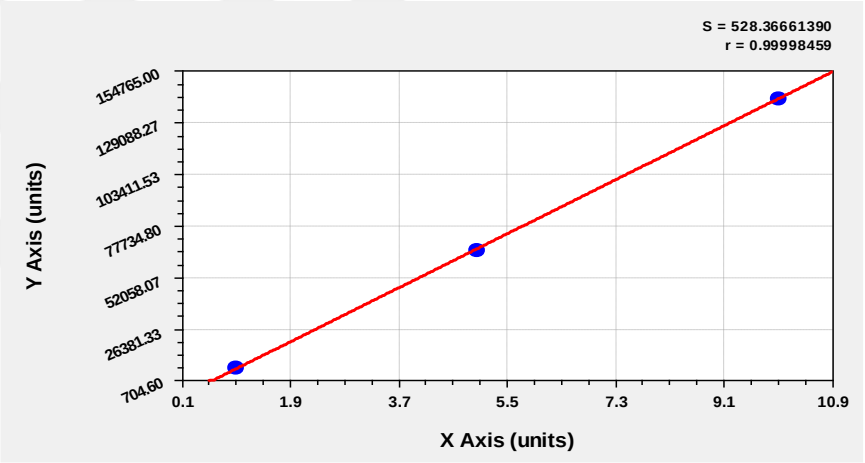


Figure 0.114. Calibration curves of 2,4'-DDT in mixture II of mix C on December 2022



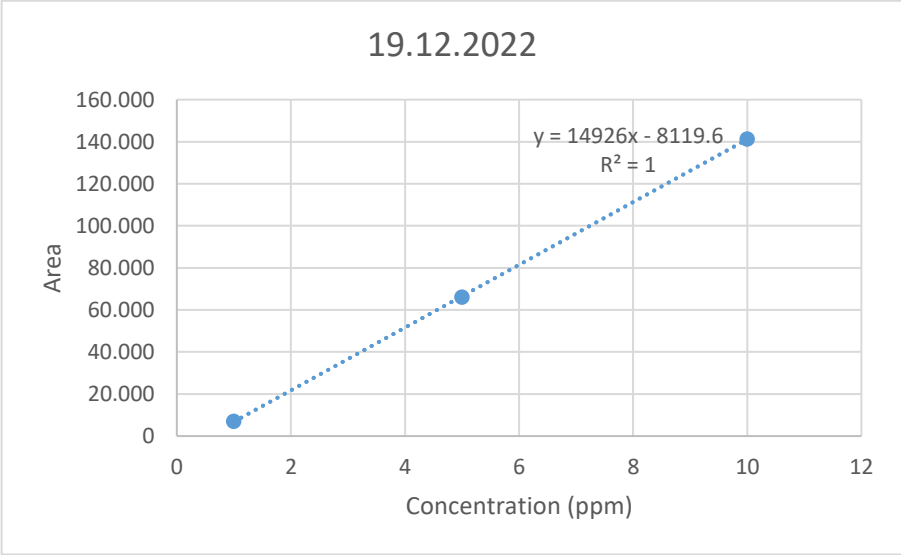


Figure 0.115. Calibration curves of 2,4'-DDT in mixture II of mix C on December 2022

Table 0.229. Names of method for *alpha*-Endosulfan in mixture II of mix C

***alpha*-endosulfan in mixture II**	
Date	**Method**
9.12.2022	pestisitsimcal4
15.12.2022	pestisitsimcal4
19.12.2022	pestisitsimcal419122022

Table 0.230. Calculation of uncertainty of calibration curve for *alpha*-Endosulfan in mixture II of mix C on December 2022

09.12.2022/15.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	12
0.5	1361	0.4	-3.41	11.62	**C_0 (ppm)**	5
1	2.803	0.8	-3.00	8.97	**C_{ort}**	3.8
2.5	8.253	2.4	-1.43	2.05	**S**	190.1
5	17.172	4.9	1.13	1.27	**B_1**	3484.6
10	34.288	9.8	6.04	36.48	**p**	1
$\bar{C}$=3.8			**S_{xx}**	7	**n**	5
					$u(C_0)$	0.031

Table 0.231. Calculation of uncertainty of calibration curve for *alpha*-Endosulfan in mixture II of mix C on December 2022

19.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	12
05	1353	0.4	-3.36	11.26	**C_0 (ppm)**	2.5
1	2781	0.9	-2.89	8.33	**C_{ort}**	3.8
2.5	7041	2.3	-1.49	2.21	**S**	258.6
5	15257	5.0	1.22	1.48	**B_1**	3042
10	30085	9.9	6.09	37.09	**p**	1
$\bar{C}$=3.8			**S_{xx}**	12	**n**	5
					$u(C_0)$	0,049

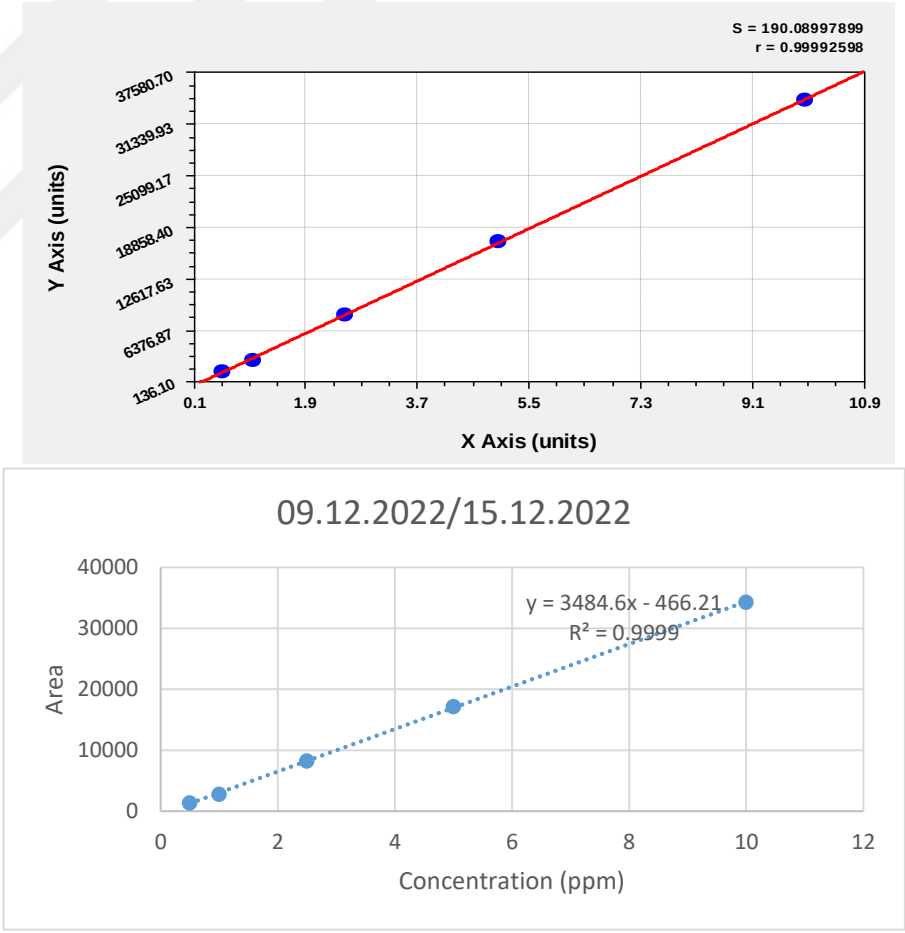


Figure 0.116. Calibration curves of *alpha*-Endosulfan in mixture II of mix C on December 2022

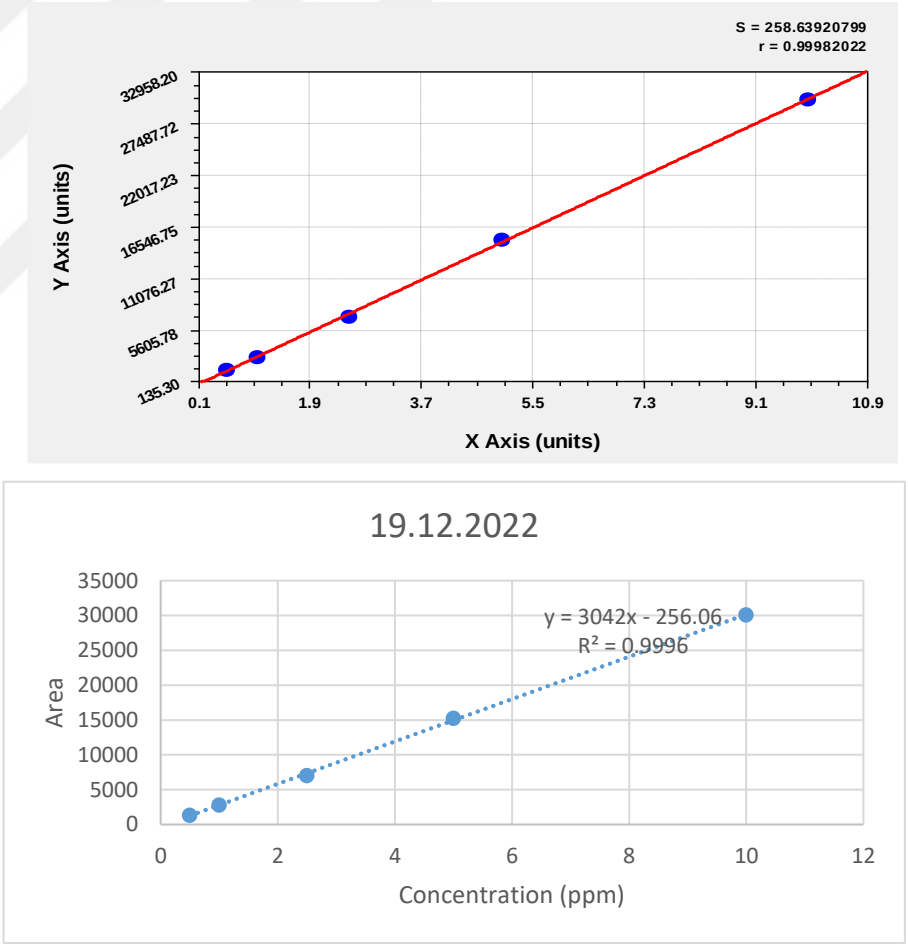


Figure 0.117. Calibration curves of *alpha*-Endosulfan in mixture II of mix C on December 2022

Table 0.232. Names of method for *beta*-Endosulfan in mixture II of mix C

***beta*-endosulfan in mixture II**	
Date	**Method**
9.12.2022	pestisitsimcal4
15.12.2022	pestisitsimcal4
19.12.2022	pestisitsimcal419122022

Table 0.233. Calculation of uncertainty of calibration curve for *beta*-Endosulfan in mixture II of mix C on December 2022

09.12.2022/15.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	15
0.5	3642	0.3	-3.21	10.31	**C_0 (ppm)**	2.5
1	9562	0.8	-2.74	7.52	**C_{ort}**	3.5
2.5	28937	2.3	-1.21	1.45	**S**	245.7
10	123339	9.8	6.28	39.41	**B_1**	12614
$\bar{C}$=2.5			**S_{xx}**	15	**p**	1
					n	4
					$u(C_0)$	0.011

Table 0.234. Calculation of uncertainty of calibration curve for *beta*-Endosulfan in mixture II of mix C on December 2022

19.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	11
2.5	46926	1.9	-3.98	15.81	**C_0 (ppm)**	5
5	105988	4.2	-1.64	2.69	**C_{ort}**	5.8
10	235657	9.3	3.49	12.19	**S**	3085.5
$\bar{C}$=5.8			**S_{xx}**	11	**B_1**	25274
					p	1
					n	4
					$u(C_0)$	0.069

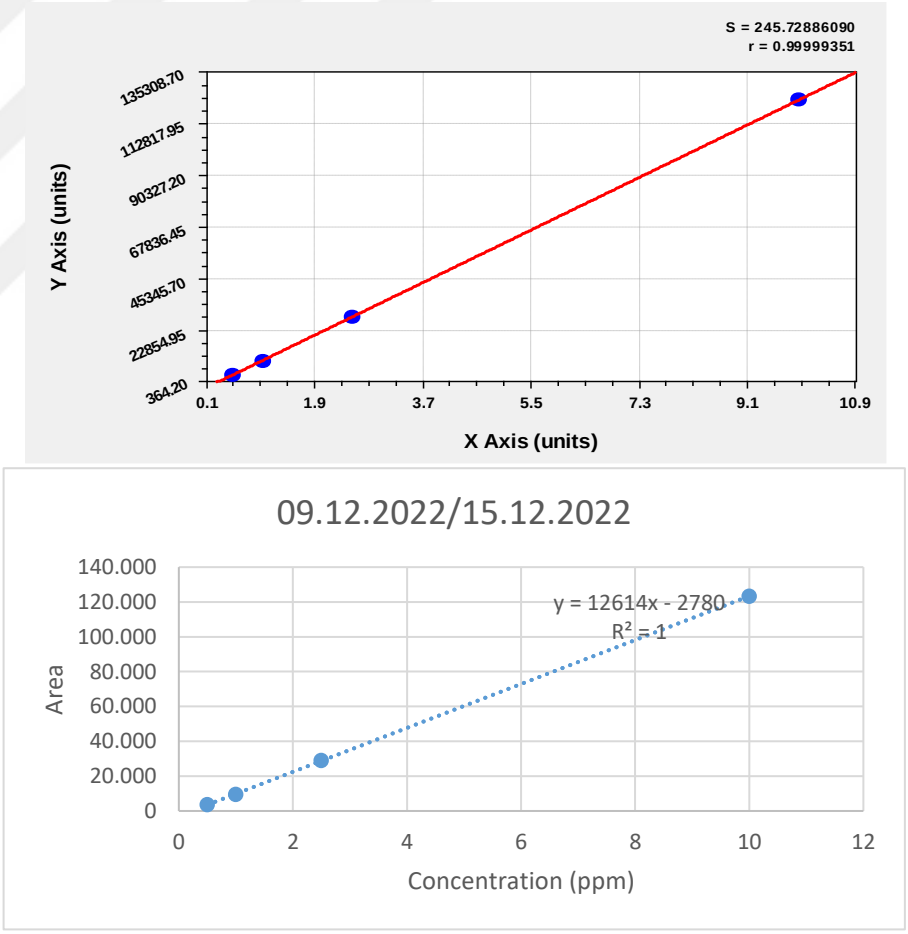


Figure 0.118. Calibration curves of *beta*-Endosulfan in mixture II of mix C on December 2022

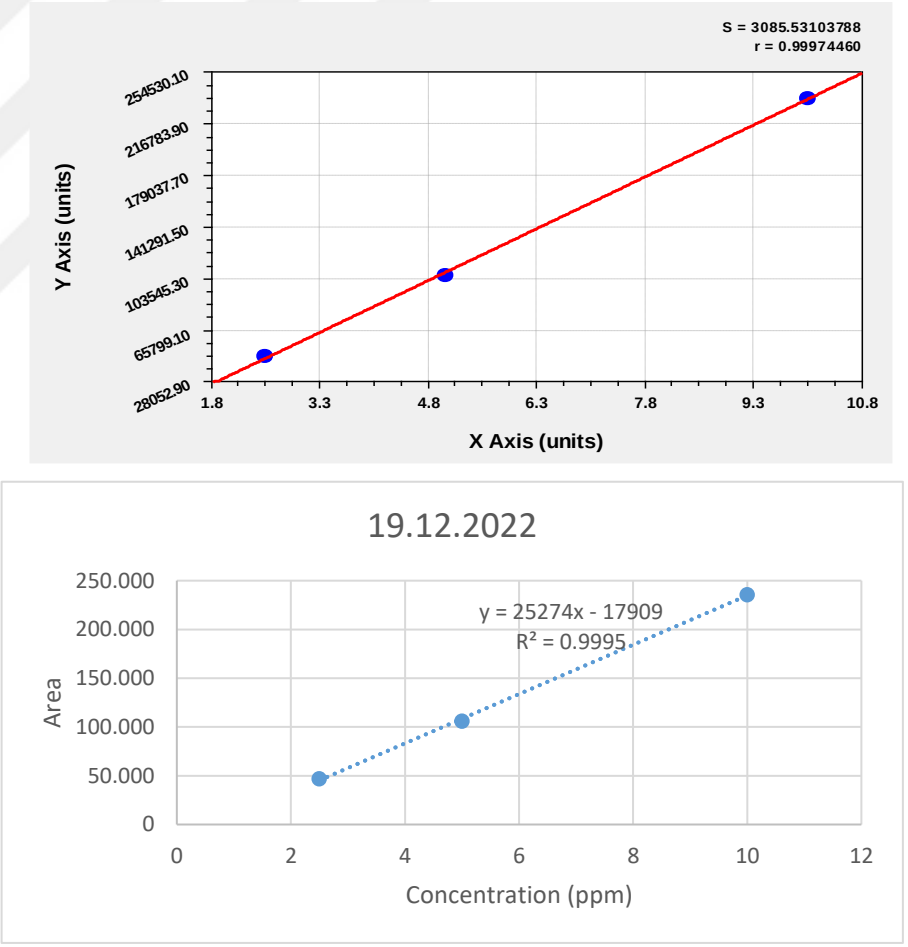


Figure 0.119. Calibration curves of *beta*-Endosulfan in mixture II of mix C on December 2022

Table 0.235. Names of method for Heptachlor in mixture II of mix C

heptachlor in mixture II	
Date	**Method**
9.12.2022	pestisitsimcal4
15.12.2022	pestisitsimcal4
19.12.2022	pestisitsimcal419122022

Table 0.236. Calculation of uncertainty of calibration curve for Heptachlor in mixture II of mix C on December 2022

09.12.2022/15.12.2022						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	12
1	9482	0.6	-3.99	15.89	**C_0 (ppm)**	5
2.5	30955	2.1	-2.54	6.45	**C_{ort}**	4.6
5	68399	4.6	-0.02	0.00026	**S**	403.8
10	142773	9.6	5.00	24.95	**B_1**	14841
$\bar{C}$=4.6			**S_{xx}**	12	**p**	1
					n	4
					$u(C_0)$	0.014

Table 0.237. Calculation of uncertainty of calibration curve for Heptachlor in mixture II of mix C on December 2022

10.06.2023 / 18.06.2023 / 25.06.2023 / 03.07.2023						
Conc (ppm)	**Area**	**C_i**	**$C_i - C_{ort}$**	**$(C_i - C_{av})^2$**	**S_{xx}**	14
1	15324	0.5	-4.78	22.90	**C_0 (ppm)**	5
5	125904	4.5	-0.83	0.68	**C_{ort}**	5.3
10	266725	9.5	4.21	17.74	**S**	940.1
$\overline{C}$=5.3			**S_{xx}**	14	**B_1**	27943
					p	1
					n	3
					$u(C_0)$	0.020

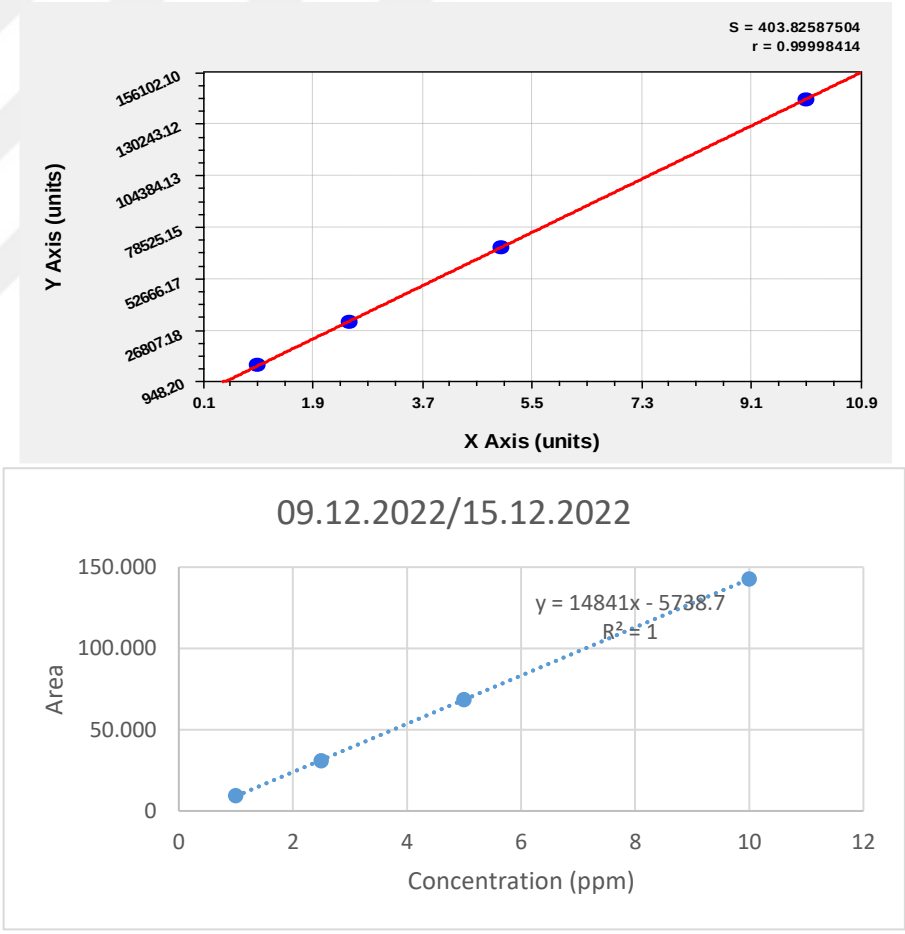
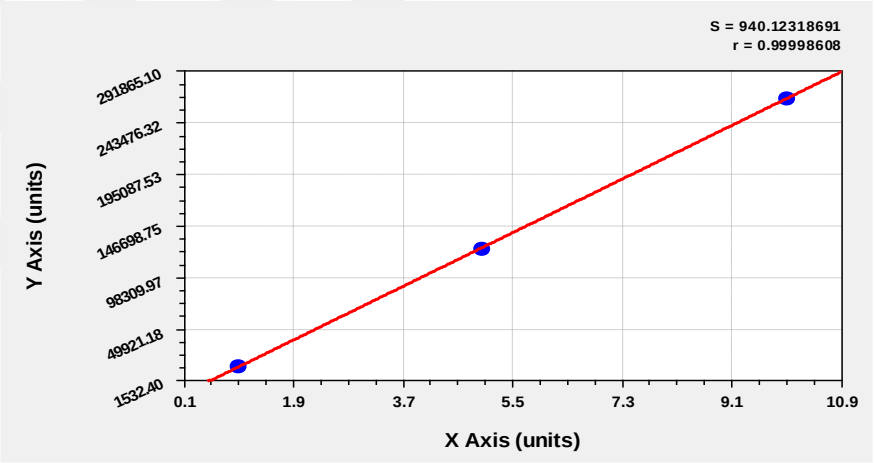


Figure 0.120. Calibration curves of Heptachlor in mixture II of mix C on December 2022



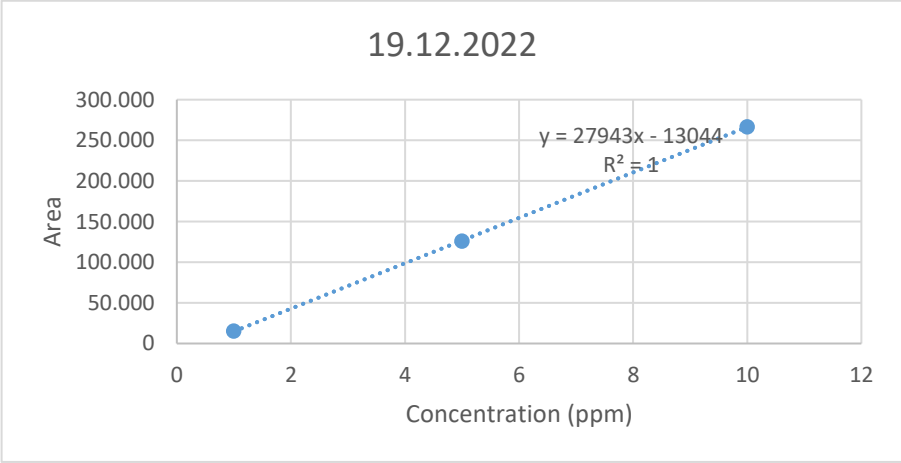


Figure 0.121. Calibration curves of Heptachlor in mixture II of mix C on December 2022

APPENDIX 6 ANOVA

Table 0.238. ANOVA results of *alpha*-HCH in mixture II of mix A

***alpha*-HCH in mixture II**	
First Bottle	**Second Bottle**
2.04	2.01
2.00	2.05
2.00	2.04
2.02	2.09
2.03	2.07

Anova: Single Factor

ABSTRACT

Groups	*n*	*Total*	*Average*	*Varience*
First Bottle	5	10.1	2.02	0.0004
Second Bottle	5	10.2	2.05	0.0009

ANOVA

Source of Varience	*SS*	*df*	*MS*	*F*	*P-value*	*F criterion*
Between Groups	0.0026	1	0.0026	4.29	0.07	5.32
Within Groups	0.0049	8	0.0006			
Total	0.0074664	9				

Table 0.239. ANOVA results of *gamma*-HCH in mixture II of mix A

***gamma*-HCH in mixture II**	
First Bottle	**Second Bottle**
2.04	2.05
2.02	2.05
2.03	1.99
1.99	2.02
2.03	2.03

Anova: Single Factor

ABSTRACT

Groups	*n*	*Total*	*Average*	*Varience*
First Bottle	5	10.1	2.0	0.0004
Second Bottle	5	10.1	2.0	0.0006

ANOVA

Source of Varience	*SS*	*df*	*MS*	*F*	*P-value*	*F criterion*
Between Groups	0.00009	1	0.0001	0.18	0.68	5.32
Within Groups	0.00396	8	0.0005			
Total	0.00405	9				

Table 0.240. ANOVA results of Aldrin in mixture II of mix A

aldrin in mixture II	
First Bottle	**Second Bottle**
2.01	2.03
2.08	2.02
2.06	2.06
2.06	2.03
2.05	2.06

Anova: Single Factor

ABSTRACT

Groups	*n*	*Total*	*Average*	*Varience*
First Bottle	5	10.3	2.1	0.0008
Second Bottle	5	10.2	2.0	0.0004

ANOVA

Source of Varience	*SS*	*df*	*MS*	*F*	*P-value*	*F criterion*
Between Groups	0.0003	1	0.0003	0.46	0.52	5.32
Within Groups	0.0048	8	0.0006			
Total	0.0050	9				

Table 0.241. ANOVA results of Dieldrin in mixture II of mix A

dieldrin in mixture II	
First Bottle	**Second Bottle**
2.02	2.08
2.04	2.06
2.03	2.09
2.01	2.02
2.04	2.00

Anova: Single Factor

ABSTRACT

Groups	*n*	*Total*	*Average*	*Varience*
First Bottle	5	10.2	2.03	0.0002
Second Bottle	5	10.2	2.05	0.0016

ANOVA

Source of Varience	*SS*	*df*	*MS*	*F*	*P-value*	*F criterion*
Between Groups	0.0008	1	0.0008	0.96	0.36	5.32
Within Groups	0.0071	8	0.0009			
Total	0.0079	9				

Table 0.242. ANOVA results of Endrin in mixture II of mix A

endrin in mixture II	
First Bottle	**Second Bottle**
2.05	2.02
1.99	2.03
2.02	2.05
2.06	2.06
2.08	2.07

Anova: Single Factor

ABSTRACT

Groups	*n*	*Total*	*Average*	*Varience*
First Bottle	5	10.2	2.04	0.0012
Second Bottle	5	10.2	2.05	0.0004

ANOVA

Source of Varience	*SS*	*df*	*MS*	*F*	*P-value*	*F criterion*
Between Groups	0.0002	1	0.0002	0.20	0.67	5.32
Within Groups	0.0066	8	0.0008			
Total	0.0067	9				

Table 0.243 ANOVA results of 4,4'-DDD in mixture II of mix A

4,4'-DDD in mixture II	
First Bottle	**Second Bottle**
2.06	2.07
2.02	2.09
2.21	2.08
2.05	2.04
2.09	2.09

Anova: Single Factor

ABSTRACT

Groups	*n*	*Total*	*Average*	*Varience*
First Bottle	5	10.4	2.09	0.0055
Second Bottle	5	10.4	2.07	0.0004

ANOVA

Source of Varience	*SS*	*df*	*MS*	*F*	*P-value*	*F criterion*
Between Groups	0.0005	1	0.0005	0.16	0.70	5.32
Within Groups	0.0236	8	0.0030			
Total	0.0241	9				

Table 0.244. ANOVA results of 4,4'-DDT in mixture II of mix A

4,4'-DDT in mixture II	
First Bottle	**Second Bottle**
2.11	2.11
2.11	2.27
2.05	2.07
2.05	2.07
2.09	2.08

Anova: Single Factor

ABSTRACT

Groups	*n*	*Total*	*Average*	*Varience*
First Bottle	5	10.4	2.08	0.00082
Second Bottle	5	10.6	2.12	0.00708

ANOVA

Source of Varience	*SS*	*df*	*MS*	*F*	*P-value*	*F criterion*
Between Groups	0.0032	1	0.0032	0.81	0.40	5.32
Within Groups	0.0316	8	0.0040			
Total	0.0348	9				

Table 0.245. ANOVA results of 2,4'-DDT in mixture II of mix A

2,4'-DDT in mixture II	
First Bottle	**Second Bottle**
2.28	2.26
2.16	2.23
2.15	2.23
2.26	2.27
2.19	2.19

Anova: Single Factor

ABSTRACT

Groups	*n*	*Total*	*Average*	*Varience*
First Bottle	5	11.1	2.21	0.0035
Second Bottle	5	11.2	2.24	0.0011

ANOVA

Source of Varience	*SS*	*df*	*MS*	*F*	*P-value*	*F criterion*
Between Groups	0.0017	1	0.0017	0.76	0.408	5.32
Within Groups	0.0183	8	0.0023			
Total	0.0200	9				

Table 0.246. ANOVA results of *alpha*-Endosulfan in mixture II of mix A

***alpha*-endosulfan in mixture II**	
First Bottle	**Second Bottle**
2.01	2.06
1.98	2.00
1.99	1.99
1.98	2.01
2.02	2.05

Anova: Single Factor

ABSTRACT

Groups	*n*	*Total*	*Average*	*Varience*
First Bottle	5	10.0	2.00	0.00041
Second Bottle	5	10.1	2.02	0.00103

ANOVA

Source of Varience	*SS*	*df*	*MS*	*F*	*P-value*	*F criterion*
Between Groups	0.0021	1	0.0021	2.84	0.13	5.32
Within Groups	0.0058	8	0.0007			
Total	0.0079	9				

Table 0.247. ANOVA results of *beta*-Endosulfan in mixture II of mix A

***beta*-endosulfan in mixture II**	
First Bottle	**Second Bottle**
2.06	2.01
2.02	2.01
2.05	2.04
2.05	2.06
2.08	2.06

Anova: Single Factor

ABSTRACT

Groups	*n*	*Total*	*Average*	*Varience*
First Bottle	5	10.3	2.05	0.00044
Second Bottle	5	10.2	2.04	0.00070

ANOVA

Source of Varience	*SS*	*df*	*MS*	*F*	*P-value*	*F criterion*
Between Groups	0.00053	1	0.0005	0.93	0.36	5.32
Within Groups	0.00454	8	0.0006			
Total	0.005074	9				

Table 0.248. ANOVA results of Heptachlor in mixture II of mix A

heptachlor in mixture II	
First Bottle	**Second Bottle**
2.01	2.05
2.01	2.04
2.02	2.07
2.05	1.92
1.97	1.94

Anova: Single Factor

ABSTRACT

Groups	*n*	*Total*	*Average*	*Varience*
First Bottle	5	10.1	2.01	0.0008
Second Bottle	5	10.0	2.00	0.0047

ANOVA

Source of Varience	*SS*	*df*	*MS*	*F*	*P-value*	*F criterion*
Between Groups	0.00021	1	0.0002	0.08	0.79	5.32
Within Groups	0.02204	8	0.0028			
Total	0.02225	9				

Table 0.249. ANOVA results of Heptachlor-*endo*-epoxide in mixture II of mix A

heptachlor-*endo*-epoxide in mixture II	
First Bottle	**Second Bottle**
2.01	2.05
2.01	2.00
2.01	2.07
2.04	2.05
2.02	2.01

Anova: Single Factor

ABSTRACT

Groups	*n*	*Total*	*Average*	*Variance*
First Bottle	5	10.1	2.02	0.00014
Second Bottle	5	10.2	2.04	0.00078

ANOVA

Source of Variance	*SS*	*df*	*MS*	*F*	*P-value*	*F criterion*
Between Groups	0.00092	1	0.0009	2.01	0.19	5.32
Within Groups	0.00367	8	0.0005			
Total	0.00490	9				

APPENDIX 7 Uncertainities of Stability of Pesticides in Mix A, mix B and Mix C at -20°C, 20°C and 4°C

Table 0.250. HCB in mixture I of mix A at -20°C for short-term stability

HCB in mixture I		
Date	**Concentration (2 ppm)**	**Day**
10.06.2023	2.05	0
18.06.2023	1.96	7
25.06.2023	2.01	14
03.07.2023	1.94	21
$\bar{Y}$	1.99	
$\bar{X}$		7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	-4.44×10^{-16}	196	-3.17×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.99	-3.17×10^{-17}	7	1.99

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.05	1.992	-3.17×10^{-17}	0	0	3.37×10^{-3}
1.96	1.992	-3.17×10^{-17}	7	-2.22×10^{-16}	9.86×10^{-4}
2.01	1.992	-3.17×10^{-17}	14	-4.44×10^{-16}	4.93×10^{-4}
1.94	1.992	-3.17×10^{-17}	21	-6.66×10^{-16}	2.39×10^{-3}
				Σ	7.24×10^{-3}
				s	6.02×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	6.02×10^{-2}	4.30×10^{-3}

$u_{sts} = t * s(b_1)$	9.03×10^{-2}
%	9.03
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.85×10^{-2}
|b1|	3.80×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.251. Metolachlor in mixture I of mix A at -20°C for short-term stability

metolachlor in mixture I		
Date	**Concentration (2 ppm)**	**Day**
10.06.2023	2.37	0
18.06.2023	2.27	7
25.06.2023	1.94	14
03.07.2023	2.31	21
$\bar{Y}$	2.22	
$\bar{X}$		7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1		
14	4.44×10^{-16}	196	3.17×10^{-17}		
$\bar{Y}$	b_1	$\bar{X}$	b_0		
2.22	-3.17x10-17	7	2.22		
Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.37	2.22	3.17×10^{-17}	0	0	2.11×10^{-2}
2.27	2.22	3.17×10^{-17}	7	-2.2×10^{-16}	2.23×10^{-3}
1.94	2.22	3.17×10^{-17}	14	$-4 \times 4 \times 10^{-16}$	7.85×10^{-2}
2.31	2.22	3.17×10^{-17}	21	$-6 \times 7 \times 10^{-16}$	7.68×10^{-3}
				Σ	1.10×10^{-1}
				s	2.34×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	2.34×10^{-1}	1.67×10^{-2}

$u_{sts} = t * s(b_1)$	3.51x10-1
%	35.1
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	7.19×10^{-2}
|b1|	7.20×10^{-3}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.252. *alpha*-HCH in mixture II of mix A at -20°C for short-term stability

***alpha*-HCH in mixture II**				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
10.06.2023	1.90	10.06.2023	1.93	0
18.06.2023	2.04	18.06.2023	2.09	7
25.06.2023	2.06	26.06.2023	1.76	14
03.07.2023	2.07	03.07.2023	2.06	21
$\bar{Y}$	2.02		1.96	
$\bar{X}$				7

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	-4.44×10^{-16}	196	-3.17×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.02	-3.17×10^{-17}	7	2.02

Yi	**b_0**	**b_1**	**X_i**	**$b_1 * X_i$**	**$(Y_i - b_0 - b_1 * X_i)^2$**
1.90	2.02	-3.17×10^{-17}	0	0	1.37×10^{-2}
2.04	2.02	-3.17×10^{-17}	7	-2.2×10^{-16}	3.61×10^{-4}
2.06	2.02	-3.17×10^{-17}	14	-4.4×10^{-16}	2.00×10^{-3}
2.07	2.02	-3.17×10^{-17}	21	-6.7×10^{-16}	2.86×10^{-3}
				Σ	1.89×10^{-2}
				s	9.73×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	**$s(b_1)$**
14	196	14	9.73×10^{-2}	6.95×10^{-3}

$u_{sts} = t * s(b_1)$	1.46×10^{-1}
%	14.6
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	2.99×10^{-2}
|b1|	7.70×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.252 (continued). *alpha*-HCH in mixture II of mix A at -20°C for short-term stability

Second Bottle

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	4.44×10^{-16}	196	3.17×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.96	3.17×10^{-17}	7	1.96

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.93	1.96	3.17×10^{-17}	0	0	7.50×10^{-4}
2.09	1.96	3.17×10^{-17}	7	2.22×10^{-16}	1.79×10^{-2}
1.76	1.96	3.17×10^{-17}	21	6.66×10^{-16}	4.17×10^{-2}
2.06	1.96	3.17×10^{-17}	21	6.66×10^{-16}	9.58×10^{-3}
				Σ	6.99×10^{-2}
				s	1.87×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	1.87×10^{-1}	1.34×10^{-2}

$u_{sts} = t * s(b_1)$	2.80×10^{-1}
%	28.0
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	5.74×10^{-2}
|b1|	5.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.253. *gamma*-HCH in mixture II of mix A at -20°C for short-term stability

***gamma*-HCH in mixture II**				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
11.06.2023	2.06	10.06.2023	2.06	0
18.06.2023	2.03	18.06.2023	2.08	7
25.06.2023	2.00	26.06.2023	2.05	14
03.07.2023	2.06	03.07.2023	2.05	21
$\bar{Y}$	2.04		2.06	
$\bar{X}$				7

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	-8.88×10^{-16}	196	-6.34×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.04	-6.34×10^{-17}	7	2.04

Yi	**b_0**	**b_1**	**X_i**	**$b_1 * X_i$**	**$(Y_i - b_0 - b_1 * X_i)^2$**
2.06	2.04	-6.34×10^{-17}	0	0	3.96×10^{-4}
2.03	2.04	-6.34×10^{-17}	7	-4.44x10-16	3.82×10^{-5}
2.00	2.04	-6.34×10^{-17}	14	-8.88x10-16	1.22×10^{-3}
2.06	2.04	-6.34×10^{-17}	21	-1.33x10-15	4.51×10^{-4}
				Σ	2.11×10^{-3}
				s	3.24×10^{-2}

$\Sigma X_i - \bar{X}$	**$(\Sigma X_i - \bar{X})^2$**	**$\sqrt{((\Sigma X_i - \bar{X})^2)}$**	**s**	**$s(b_1)$**
14	196	14	3.24×10^{-2}	2.32×10^{-3}

$u_{sts} = t * s(b_1)$	4.87×10^{-2}
%	4.87
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	9.97×10^{-3}
|b1|	4.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.253 (continued). *gamma*-HCH in mixture II of mix A at -20°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	-8.88×10^{-16}	196	-6.34×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.06	-6.34×10^{-17}	7	2.06

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.06	2.06	-6.34×10^{-17}	0	0	6.59×10^{-6}
2.08	2.06	-6.34×10^{-17}	7	-4.44×10^{-16}	4.20×10^{-4}
2.05	2.06	-6.34×10^{-17}	21	-8.88×10^{-16}	8.39×10^{-5}
2.05	2.06	-6.34×10^{-17}	21	-1.33×10^{-15}	7.70×10^{-5}
				Σ	5.88×10^{-4}
				s	1.71×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	1.71×10^{-2}	1.22×10^{-3}

$u_{sts} = t * s(b_1)$	2.57×10^{-2}
%	2.57
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	5.27×10^{-3}
|b1|	7.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.254. Aldrin in mixture II of mix A at -20°C for short-term stability

aldrin in mixture II				
First Bottle		Second Bottle		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day(X_i)**
11.06.2023	2.05	11.06.2023	2.07	0
18.06.2023	2.03	18.06.2023	2.11	7
26.06.2023	2.09	26.06.2023	2.09	14
03.07.2023	2.05	03.07.2023	2.03	21
$\bar{Y}$	2.06		2.07	
$\bar{X}$				7

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	4.44×10^{-16}	196	3.17×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.06	3.17×10^{-17}	7	2.06

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.05	2.06	3.17×10^{-17}	0	0	2.17×10^{-5}
2.03	2.06	3.17×10^{-17}	7	2.2×10^{-16}	6.69×10^{-4}
2.09	2.06	3.17×10^{-17}	14	4.4×10^{-16}	1.45×10^{-3}
2.05	2.06	3.17×10^{-17}	21	6.7×10^{-16}	5.65×10^{-5}
				Σ	2.19×10^{-3}
				s	3.31×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	3.31×10^{-2}	2.37×10^{-3}

$u_{sts}=t*s(b_1)$	4.97×10^{-2}
%	4.97
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.02×10^{-2}
|b1|	8.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.254 (continued). Aldrin in mixture II of mix A at -20°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	0	196	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.07	0	7	2.07

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.07	2.07	0	0	0	6.64×10^{-7}
2.11	2.07	0	7	0	1.24×10^{-3}
2.09	2.07	0	21	0	1.57×10^{-4}
2.03	2.07	0	21	0	2.20×10^{-3}
				Σ	3.59×10^{-3}
				s	4.24×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	4.24×10^{-2}	3.03×10^{-3}

$u_{sts} = t * s(b_1)$	6.35×10^{-2}
%	6.35
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.30×10^{-2}
|b1|	2.30×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.255. Dieldrin in mixture II of mix A at -20°C for short-term stability

dielrin in mixture II				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day(X_i)**
11.06.2023	2.07	11.06.2023	2.05	0
18.06.2023	2.04	18.06.2023	2.08	7
25.06.2023	2.13	26.06.2023	2.10	14
03.07.2023	2.03	03.07.2023	2.06	21
$\bar{Y}$	2.07		2.07	
$\bar{X}$				7

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	$4.44x10^{-16}$	1.96	$3.17x10^{-17}$
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.07	$3.17x10^{-17}$	7	2.07

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.07	2.07	$3.17x10^{-17}$	0	0	$3.11x10^{-5}$
2.04	2.07	$3.17x10^{-17}$	7	$2.2x10^{-16}$	$9.17x10^{-4}$
2.13	2.07	$3.17x10^{-17}$	14	$4.4x10^{-16}$	$4.24x10^{-3}$
2.03	2.07	$3.17x10^{-17}$	21	$6.7x10^{-16}$	$1.63x10^{-3}$
				Σ	$6.82x10^{-3}$
				s	$5.84x10^{-2}$

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	$5.84x10^{-2}$	$4.17x10^{-3}$

$u_{sts}=t*s(b_1)$	$8.76x10^{-2}$
%	8.76
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	$1.79x10^{-2}$
|b1|	$6.00x10^{-4}$
|b1| < tcrit.*$s(b_1)$	stable

Table 0. 255 (continued). Dieldrin in mixture II of mix A at -20°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	-8.88×10^{-16}	1.96	-6.34×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.07	-6.34×10^{-17}	7	2.07

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.05	2.07	-6.34×10^{-17}	0	0	6.84×10^{-4}
2.08	2.07	-6.34×10^{-17}	7	-4.44×10^{-16}	4.95×10^{-5}
2.10	2.07	-6.34×10^{-17}	21	-8.88×10^{-16}	8.07×10^{-4}
2.06	2.07	-6.34×10^{-17}	21	-1.33×10^{-15}	8.66×10^{-5}
				Σ	1.63×10^{-3}
				s	2.85×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	2.85×10^{-02}	2.04×10^{-3}

$u_{sts}=t*s(b_1)$	4.28×10^{-2}
%	4.28
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	8.76×10^{-3}
$\|b1\|$	1.00×10^{-3}
$\|b1\| < tcrit.*s(b_1)$	stable

Table 0.256. Endrin in mixture II of mix A at -20°C for short-term stability

endrin in mixture II				
First Bottle		Second Bottle		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
10.06.2023	2.05	10.06.2023	2.02	0
19.06.2023	2.06	18.06.2023	2.06	7
26.06.2023	2.03	26.06.2023	2.01	14
03.07.2023	2.03	03.07.2023	2.04	21
$\bar{Y}$	2.04		2.03	
$\bar{X}$				7

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	4.44×10^{-16}	196	-3.17×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.04	3.17×10^{-17}	7	2.04

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.05	2.04	-3.17×10^{-17}	0	0	5.08×10^{-5}
2.06	2.04	-3.17×10^{-17}	7	-2.2×10^{-16}	2.19×10^{-4}
2.03	2.04	-3.17×10^{-17}	14	-4.4×10^{-16}	4.74×10^{-5}
2.03	2.04	-3.17×10^{-17}	21	-6.7×10^{-16}	2.27×10^{-4}
				Σ	5.44×10^{-4}
				s	1.65×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	1.65×10^{-2}	1.18×10^{-3}

$u_{sts}=t*s(b_1)$	2.47×10^{-2}
%	2.47
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	5.07×10^{-3}
|b1|	1.30×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.256 (continued). Endrin in mixture II of mix A at -20°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	1.33×10^{-15}	196	9.52×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.03	3.17×10^{-17}	7	2.03

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.02	2.03	9.52×10^{-17}	0	0	1.25×10^{-4}
2.06	2.03	9.52×10^{-17}	7	6.66x10-16	7.18×10^{-4}
2.01	2.03	9.52×10^{-17}	21	1.33x10-15	4.13×10^{-4}
2.04	2.03	9.52×10^{-17}	21	2.00x10-15	2.24×10^{-5}
				Σ	1.28×10^{-3}
				s	2.53×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	2.53×10^{-2}	1.81×10^{-3}

$u_{sts}=t*s(b_1)$	3.79×10^{-2}
%	3.79
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	7.77×10^{-3}
|b1|	9.00×10^{-6}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.257. 4,4'-DDD in mixture II of mix A at -20°C for short-term stability

4,4'-DDD in mixture II				
First Bottle		Second Bottle		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
11.06.2023	2.06	11.06.2023	2.07	0
19.06.2023	2.02	19.06.2023	2.09	7
26.06.2023	2.05	26.06.2023	2.04	14
03.07.2023	2.09	03.07.2023	2.09	21
$\bar{Y}$	2.05		2.07	
$\bar{X}$				7

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	4.44×10^{-16}	196	3.17×10^{-17}

$\bar{Y}$	b_1	$\bar{X}$	b_0
2.05	3.17×10^{-17}	7	2.05

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.06	2.05	3.17×10^{-17}	0	0	3.50×10^{-5}
2.02	2.05	3.17×10^{-17}	7	2.2×10^{-16}	1.03×10^{-3}
2.05	2.05	3.17×10^{-17}	14	4.4×10^{-16}	7.96×10^{-5}
2.09	2.05	3.17×10^{-17}	21	6.7×10^{-16}	1.23×10^{-3}
				Σ	2.37×10^{-3}
				s	3.45×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	3.45×10^{-2}	2.46×10^{-3}

$u_{sts}=t*s(b_1)$	5.17×10^{-2}
%	5.17
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.06×10^{-2}
|b1|	1.60×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.257 (continued). 4,4'-DDD in mixture II of mix A at -20°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	4.44×10^{-16}	196	3.17×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.07	3.17×10^{-17}	7	2.07

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.07	2.07	3.17×10^{-17}	0	0	5.98×10^{-6}
2.09	2.07	3.17×10^{-17}	7	2.22×10^{-16}	3.24×10^{-4}
2.04	2.07	3.17×10^{-17}	21	4.44×10^{-16}	1.02×10^{-3}
2.09	2.07	3.17×10^{-17}	21	6.66×10^{-16}	2.69×10^{-4}
				Σ	1.62×10^{-3}
				s	2.85×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	2.85×10^{-2}	2.03×10^{-3}

$u_{sts} = t * s(b_1)$	4.27×10^{-2}
%	4.27
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	8.74×10^{-3}
|b1|	9.00×10^{-5}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.258. 4,4'-DDT in mixture II of mix A at -20°C for short-term stability

4,4'-DDT in mixture II				
First Bottle		Second Bottle		
Date	Concentration (2 ppm)	Date	Concentration (2 ppm)	Day
11.06.2023	2.11	11.06.2023	2.11	0
19.06.2023	2.05	19.06.2023	2.07	7
26.06.2023	2.05	26.06.2023	2.07	14
03.07.2023	2.09	03.07.2023	2.08	21
$\bar{Y}$	2.08		2.08	
$\bar{X}$				7

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	4.44×10^{-16}	196	3.17×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.08	3.17×10^{-17}	7	2.08

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.11	2.08	3.17×10^{-17}	0	0	1.09×10^{-3}
2.05	2.08	3.17×10^{-17}	7	2.2×10^{-16}	4.73×10^{-4}
2.05	2.08	3.17×10^{-17}	14	4.4×10^{-16}	5.86×10^{-4}
2.09	2.08	3.17×10^{-17}	21	6.7×10^{-16}	1.67×10^{-4}
				Σ	2.32×10^{-3}
				s	3.41×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	3.41×10^{-2}	2.43×10^{-3}

$u_{sts}=t*s(b_1)$	5.11×10^{-2}
%	5.11
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.05×10^{-2}
|b1|	9.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.258 (continued). 4,4'-DDT in mixture II of mix A at -20°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	4.44×10^{-16}	196	3.17×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.08	3.17×10^{-17}	7	2.08

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.11	2.08	3.17×10^{-17}	0	0	8.99×10^{-4}
2.07	2.08	3.17×10^{-17}	7	2.22×10^{-16}	2.83×10^{-4}
2.07	2.08	3.17×10^{-17}	21	4.44×10^{-16}	1.44×10^{-4}
2.08	2.08	3.17×10^{-17}	21	6.66×10^{-16}	1.35×10^{-6}
				Σ	1.33×10^{-3}
				s	2.58×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	2.58×10^{-2}	1.84×10^{-3}

$u_{sts} = t * s(b_1)$	3.86×10^{-2}
%	3.86
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	7.91×10^{-3}
|b1|	1.30×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.259. 2,4'-DDT in mixture II of mix A at -20°C for short-term stability

2,4'-DDT in mixture II				
First Bottle		Second Bottle		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
11.06.2023	2.16	11.06.2023	2.23	0
19.06.2023	2.15	19.06.2023	2.23	7
26.06.2023	2.19	26.06.2023	2.19	14
03.07.2023	2.16	03.07.2023	2.11	21
$\bar{Y}$	2.17		2.19	
$\bar{X}$				7

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	8.88×10^{-16}	196	6.34×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.17	6.34×10^{-17}	7	2.17

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.16	2.17	6.34×10^{-17}	0	0	1.41×10^{-2}
2.15	2.17	6.34×10^{-17}	7	4.44×10^{-16}	2.71×10^{-4}
2.19	2.17	6.34×10^{-17}	14	8.88×10^{-16}	6.44×10^{-4}
2.16	2.17	6.34×10^{-17}	21	1.33×10^{-15}	5.76×10^{-5}
				Σ	1.51×10^{-2}
				s	8.69×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	8.69×10^{-2}	6.21×10^{-3}

$u_{sts}=t*s(b_1)$	1.30×10^{-1}
%	13.0
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	2.67×10^{-2}
|b1|	3.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.259 (continued). 2,4'-DDT in mixture II of mix A at -20°C for short-term stability

Second Bottle						
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1			
14	0	196	0			
$\bar{Y}$	b_1	$\bar{X}$	b_0			
2.19	0	7	2.19			
Yi		**b_0**	**b_1**	**X_i**	**$b_1 * X_i$**	**$(Y_i-b_0-b_1*X_i)^2$**
2.26		2.19	0	0	0	5.15×10^{-3}
2.23		2.19	0	7	0	1.74×10^{-3}
2.19		2.19	0	21	0	1.27×10^{-5}
2.11		2.19	0	21	0	6.53×10^{-3}
					Σ	1.34×10^{-2}
					s	8.20×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	**$s(b_1)$**
14	196	14	8.13×10^{-2}	5.81×10^{-3}

$u_{sts}=t*s(b_1)$	1.22×10^{-1}
%	12.2
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	2.50×10^{-2}
|b1|	5.90×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.260. *alpha*-Endosulfan in mixture II of mix A at -20°C for short-term stability

***alpha*-endosulfan in mixture II**				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
11.06.2023	2.02	11.06.2023	2.04	0
19.06.2023	2.05	19.06.2023	2.06	7
25.06.2023	2.04	25.06.2023	2.05	14
03.07.2023	1.99	03.07.2023	1.88	21
$\bar{Y}$	2.02		2.01	
$\bar{X}$				7

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	-8.88×10^{-16}	1.96	-6.34×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.02	-6.34×10^{-17}	7	2.02

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.02	2.02	-6.34×10^{-17}	0	0	2.83×10^{-5}
2.05	2.02	-6.34×10^{-17}	7	-4.44x10-16	5.02×10^{-4}
2.04	2.02	-6.34×10^{-17}	14	-8.88x10-16	1.94×10^{-4}
1.99	2.02	-6.34×10^{-17}	21	-1.33x10-15	9.61×10^{-4}
				Σ	1.68×10^{-3}
				s	2.90×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	**s(b_1)**
14	196	14	2.90×10^{-2}	2.07×10^{-3}

$u_{sts}=t*s(b_1)$	4.35×10^{-2}
%	4.35
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	8.91×10^{-3}
|b1|	1.20×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.260 (continued). *alpha*-Endosulfan in mixture II of mix A at -20°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	0	196	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.01	0	7	2.01

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.04	2.01	0	0	0	1.09×10^{-3}
2.06	2.01	0	7	2.22×10^{-16}	3.04×10^{-3}
2.05	2.01	0	14	6.66×10^{-16}	1.67×10^{-3}
1.88	2.01	0	21	6.66×10^{-16}	1.66×10^{-2}
				Σ	2.24×10^{-2}
				s	1.06×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	1.06×10^{-1}	7.56×10^{-3}

$u_{sts} = t * s(b_1)$	1.59×10^{-1}
%	15.9
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	3.25×10^{-2}
|b1|	7.10×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.261. *beta*-Endosulfan in mixture II of mix A at -20°C for short-term stability

***beta*-endosulfan in mixture II**				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
11.06.2023	2.04	11.06.2023	2.05	0
19.06.2023	2.04	19.06.2023	2.08	7
26.06.2023	2.03	26.06.2023	2.06	14
03.07.2023	2.04	03.07.2023	1.94	21
$\bar{Y}$	2.04		2.03	
$\bar{X}$				7

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	4.44×10^{-16}	196	3.17×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.04	3.17×10^{-17}	7	2.04

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.04	2.04	3.17×10^{-17}	0	0	6.49×10^{-5}
2.04	2.04	3.17×10^{-17}	7	2.2×10^{-16}	2.07×10^{-7}
2.03	2.04	3.17×10^{-17}	14	4.4×10^{-16}	6.54×10^{-5}
2.04	2.04	3.17×10^{-17}	21	6.7×10^{-16}	1.81×10^{-7}
				Σ	1.31×10^{-4}
				s	8.08×10^{-3}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	**s(b_1)**
14	196	14	8.08×10^{-3}	5.77×10^{-4}

$u_{sts} = t * s(b_1)$	1.21×10^{-2}
%	1.21
tcrit. n-2 at 95 CL	4.3
tcrit. * s(b_1)	2.48×10^{-3}
|b1|	5.00×10^{-4}
|b1| < tcrit.*s(b_1)	stable

Table 0.261 (continued). *beta*-Endosulfan in mixture II of mix A at -20°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	-8.88×10^{-16}	196	-6.34×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.03	-6.34×10^{-17}	7	2.03

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.05	2.03	-6.34×10^{-17}	0	0	2.05×10^{-4}
2.08	2.03	-6.34×10^{-17}	7	-4.44×10^{-16}	2.28×10^{-3}
2.06	2.03	-6.34×10^{-17}	14	-8.88×10^{-16}	8.89×10^{-4}
1.94	2.03	-6.34×10^{-17}	21	-1.33×10^{-15}	8.45×10^{-3}
	-6.34x10-17 -6.34x10-17			**Σ**	1.18×10^{-2}
				s	7.69×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	7.69×10^{-2}	5.49×10^{-3}

$u_{sts} = t * s(b_1)$	1.15×10^{-1}
%	11.5
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	2.36×10^{-2}
|b1|	4.80×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.262. Heptachlor in mixture II of mix A at -20°C for short-term stability

heptachlor in mixture II				
First Bottle		Second Bottle		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
11.06.2023	2.01	10.06.2023	2.05	0
18.06.2023	2.01	18.06.2023	2.04	7
26.06.2023	1.97	26.06.2023	1.94	14
03.07.2023	1.77	03.07.2023	1.70	21
$\bar{Y}$	1.94		1.93	
$\bar{X}$				7

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	-2.22×10^{-16}	196	-1.59×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.94	-1.59×10^{-17}	7	1.94

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.01	1.94	-1.59×10^{-17}	0	0	4.63×10^{-3}
2.01	1.94	-1.59×10^{-17}	7	-1.11×10^{-16}	5.12×10^{-3}
1.97	1.94	-1.59×10^{-17}	14	-2.22×10^{-16}	1.01×10^{-3}
1.77	1.94	-1.59×10^{-17}	21	-3.33×10^{-16}	2.94×10^{-2}
				Σ	4.02×10^{-2}
				s	1.42×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	1.42×10^{-1}	1.01×10^{-2}

$u_{sts}=t*s(b_1)$	2.13×10^{-1}
%	21.3
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	4.35×10^{-2}
|b1|	1.08×10^{-2}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.262 (continued). Heptachlor in mixture II of mix A at -20°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	-2.22×10^{-16}	196	-1.59×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.93	-1.59×10^{-17}	7	1.93

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.05	1.93	-1.59×10^{-17}	0	0	1.42×10^{-2}
2.04	1.93	-1.59×10^{-17}	7	-1.11x10-16	1.13×10^{-2}
1.94	1.93	-1.59×10^{-17}	14	-2.22x10-16	8.60×10^{-5}
1.70	1.93	-1.59×10^{-17}	21	-3.33x10-16	5.50×10^{-2}
				Σ	8.05×10^{-2}
				s	2.01×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	2.01×10^{-1}	1.43×10^{-2}

$u_{sts} = t * s(b_1)$	3.01×10^{-1}
%	30.1
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	6.16×10^{-2}
|b1|	1.65×10^{-2}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.263. Heptachlor-*endo*-epoxide in mixture II of mix A at -20°C for short-term stability

heptachlor-*endo*-epoxide in mixture II				
First Bottle		Second Bottle		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
11.06.2023	2.09	11.06.2023	2.09	0
19.06.2023	2.03	19.06.2023	2.02	7
26.06.2023	2.05	26.06.2023	2.01	14
03.07.2023	2.03	03.07.2023	2.02	21
$\bar{Y}$	2.05		2.04	
$\bar{X}$				7

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	$8.88x10^{-16}$	196	$6.34x10^{-17}$
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.05	$6.34x10^{-17}$	7	2.05

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.09	2.05	$6.34x10^{-17}$	0	0	$1.78x10^{-3}$
2.03	2.05	$6.34x10^{-17}$	7	$4.44x10^{-16}$	$5.23x10^{-4}$
2.05	2.05	$6.34x10^{-17}$	14	$8.88x10^{-16}$	$1.52x10^{-5}$
2.03	2.05	$6.34x10^{-17}$	21	$1.33x10^{-15}$	$2.37x10^{-4}$
				Σ	$2.56x10^{-3}$
				s	$3.58x10^{-2}$

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	$3.58x10^{-2}$	$2.55x10^{-3}$

$u_{sts}=t*s(b_1)$	$5.36x10^{-2}$
%	5.36
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	$1.10x10^{-2}$
|b1|	$2.20x10^{-3}$
|b1| < tcrit.*$s(b_1)$	stable

Table 0.263 (continued). Heptachlor-*endo*-epoxide in mixture II of mix A at -20°C for short-term stability

Second Bottle						
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1			
14	8.88×10^{-16}	196	6.34×10^{-17}			
$\bar{Y}$	b_1	$\bar{X}$	b_0			
2.04	6.34×10^{-17}	7	2.04			
Yi		**b_0**	**b_1**	**X_i**	**$b_1 * X_i$**	**$(Y_i - b_0 - b_1 * X_i)^2$**
2.09		2.04	2.04	0	0	2.80×10^{-3}
2.02		2.04	2.04	7	-4.44×10^{-16}	1.40×10^{-4}
2.01		2.04	2.04	14	-8.88×10^{-16}	7.98×10^{-4}
2.02		2.04	2.04	21	-1.33×10^{-15}	1.64×10^{-4}
		2.04	2.04		**Σ**	3.90×10^{-3}
					s	4.42×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	**$s(b_1)$**
14	196	14	4.42×10^{-2}	3.15×10^{-3}

$u_{sts} = t * s(b_1)$	6.62×10^{-2}
%	6.62
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.36×10^{-2}
|b1|	3.10×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.264. *alpha*-HCH in mix C at -20°C for short-term stability

***alpha*-HCH in mix C**		
Date	**Concentration (2 ppm)**	**Day**
9.12.2022	1.98	0
15.12.2022	1.99	6
19.12.2022	2.03	10
$\bar{Y}$	2.00	
$\bar{X}$		5

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1		
1.00	4.44×10^{-16}	1.00	4.44×10^{-16}		
$\bar{Y}$	b_1	$\bar{X}$	b_0		
2.00	-3.17×10^{-17}	5	2.00		
Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.98	2.00	4.44×10^{-16}	0	0	5.90×10^{-4}
1.99	2.00	4.44×10^{-16}	6	2.66x10-15	6.63×10^{-5}
2.03	2.00	4.44×10^{-16}	10	4.44x10-15	1.05×10^{-3}
				Σ	1.71×10^{-3}
				s	4.13×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
1	1	1	4.13×10^{-2}	4.13×10^{-2}

$u_{sts}=t*s(b_1)$	4.13×10^{-1}
%	41.3
tcrit. n-2 at 95 CL	12.7
tcrit. * $s(b_1)$	5.25×10^{-1}
|b1|	5.40×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.265. *gamma*-HCH in mix C at -20°C for short-term stability

***gamma*-HCH in mix C**		
Date	**Concentration (2 ppm)**	**Day**
9.12.2022	1.77	0
15.12.2022	1.91	6
19.12.2022	1.74	10
$\bar{Y}$	1.81	
$\bar{X}$		5

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
1.00	-2.22×10^{-16}	1.00	-2.22×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.81	-2.22×10^{-16}	5	1.81

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.77	1.81	-2.22×10^{-16}	0	0	1.37×10^{-3}
1.91	1.81	-2.22×10^{-16}	6	-1.33x10-15	1.02×10^{-2}
1.74	1.81	-2.22×10^{-16}	10	-2.22x10-15	4.08×10^{-3}
				Σ	1.56×10^{-2}
				s	1.25×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
1	1	1	1.25×10^{-1}	1.25×10^{-1}

$u_{sts} = t * s(b_1)$	1.25
%	125.0
tcrit. n-2 at 95 CL	12.7
tcrit. * $s(b_1)$	1.59
|b1|	7.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.266. Aldrin in mix C at -20°C for short-term stability

aldrin in mix C		
Date	**Concentration (2 ppm)**	**Day**
9.12.2022	1.87	0
15.12.2022	1.61	6
19.12.2022	1.74	10
$\bar{Y}$	1.74	
$\bar{X}$		5

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
1.00	-4.44×10^{-16}	1.00	-4.44×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.74	-4.44×10^{-16}	5	1.74

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.87	1.74	-4.44×10^{-16}	0	0	1.76×10^{-2}
1.61	1.74	-4.44×10^{-16}	6	-2.66x10-15	1.66×10^{-2}
1.74	1.74	-4.44×10^{-16}	10	-4.44x10-15	1.39×10^{-5}
				Σ	7.24×10^{-3}
				s	6.02×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
1	1	1	1.85×10^{-1}	1.85×10^{-1}

$u_{sts}=t*s(b_1)$	1.85
%	184.9
tcrit. n-2 at 95 CL	12.7
tcrit. * $s(b_1)$	2.35
|b1|	1.60×10^{-2}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.267. Dieldrin in mix C at -20°C for short-term stability

dielrin in mix C		
Date	**Concentration (2 ppm)**	**Day**
9.12.2022	2.58	0
15.12.2022	2.48	6
19.12.2022	2.48	10
$\bar{Y}$	2.51	
$\bar{X}$		5

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
1.00	0	1.00	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.51	0	5	2.51

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.58	2.51	0	0	0	4.84×10^{-3}
2.48	2.51	0	6	0	9.40×10^{-4}
2.48	2.51	0	10	0	1.51×10^{-3}
				Σ	7.29×10^{-3}
				s	8.54×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
1	1	1	8.54×10^{-2}	8.54×10^{-2}

$u_{sts} = t * s(b_1)$	8.54×10^{-1}
%	85.4
tcrit. n-2 at 95 CL	12.7
tcrit. * $s(b_1)$	1.08
|b1|	1.13×10^{-2}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.268. Endrin in mix C at -20°C for short-term stability

endrin in mix C		
Date	**Concentration (2 ppm)**	**Day**
9.12.2022	4.52	0
15.12.2022	4.71	6
19.12.2022	3.73	10

$\bar{Y}$	4.32
$\bar{X}$	5

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1		
1.0	0	1.00	0		
$\bar{Y}$	b_1	$\bar{X}$	b_0		
4.32	0	5	4.32		
Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i-b_0-b_1*X_i)^2$
4.52	4.32	0	0	0	4.01×10^{-2}
4.71	4.32	0	6	0	1.55×10^{-1}
3.73	4.32	0	10	0	3.53×10^{-1}
				Σ	5.49×10^{-1}
				s	7.41×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
1	1	1	7.41×10^{-1}	7.41×10^{-1}

$u_{sts}=t*s(b_1)$	7.40
%	740.0
tcrit. n-2 at 95 CL	12.7
tcrit. * $s(b_1)$	9.41
|b1|	7.07×10^{-2}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.269. 4,4'-DDD in mix C at -20°C for short-term stability

4,4'-DDD in mix C		
Date	**Concentration (2 ppm)**	**Day**
9.12.2022	2.06	0
15.12.2022	2.05	6
19.12.2022	2.08	10
$\bar{Y}$	2.06	
$\bar{X}$		5

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
1.00	-4.44×10^{-16}	1.00	-4.44×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.06	-4.44×10^{-16}	5	2.06

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.98	2.06	-4.44×10^{-16}	0	0	7.49×10^{-3}
1.99	2.06	-4.44×10^{-16}	6	-2.66×10^{-15}	4.96×10^{-3}
2.03	2.06	-4.44×10^{-16}	10	-4.44×10^{-15}	8.90×10^{-4}
				Σ	1.33×10^{-2}
				s	1.15×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
1	1	1	1.15×10^{-1}	1.15×10^{-1}

$u_{sts} = t * s(b_1)$	1.15
%	115.4
tcrit. n-2 at 95 CL	12.7
tcrit. * $s(b_1)$	1.47
|b1|	2.20×10^{-3}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.270. 4,4’-DDT in mix C at -20°C for short-term stability

4,4’-DDT in mix C		
Date	**Concentration (2 ppm)**	**Day**
9.12.2022	2.47	0
15.12.2022	2.48	6
19.12.2022	2.29	10
$\bar{Y}$	2.42	
$\bar{X}$	7	

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1		
1.00	0	1.00	0		
$\bar{Y}$	b_1	$\bar{X}$	b_0		
2.42	0	5	2.42		
Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i-b_0-b_1*X_i)^2$
2.47	2.42	0	0	0	$3.52\text{x}10^{-3}$
2.48	2.42	0	6	0	$4.64\text{x}10^{-3}$
2.29	2.42	0	10	0	$1.62\text{x}10^{-2}$
				Σ	$2.44\text{x}10^{-2}$
				s	$1.56\text{x}10^{-1}$

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
1	1	1	0.16	0.156

$u_{sts}=t*s(b_1)$	1.56
%	156.0
tcrit. n-2 at 95 CL	12.7
tcrit. * $s(b_1)$	1.98
|b1|	$1.72\text{x}10^{-2}$
|b1| < tcrit.*$s(b_1)$	stable

Table 0.271. 2,4'-DDT in mix C at -20°C for short-term stability

2,4'-DDT in mix C		
Date	**Concentration (2 ppm)**	**Day**
9.12.2022	2.47	0
15.12.2022	2.48	6
19.12.2022	2.26	10
$\bar{Y}$	2.40	
$\bar{X}$		5

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
1.00	4.44×10^{-16}	1.00	4.44×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.40	4.44×10^{-16}	5	2.40

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.47	2.40	4.44×10^{-16}	0	0	4.72×10^{-3}
2.48	2.40	4.44×10^{-16}	6	2.66×10^{-15}	5.32×10^{-3}
2.26	2.40	4.44×10^{-16}	10	4.44×10^{-15}	2.00×10^{-2}
				Σ	3.01×10^{-2}
				s	1.73×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
1	1	1	1.73×10^{-1}	1.73×10^{-1}

$u_{sts} = t * s(b_1)$	1.73
%	173.0
tcrit. n-2 at 95 CL	12.7
tcrit. * $s(b_1)$	2.20
|b1|	1.93×10^{-2}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.272. *alpha*-Endosulfan in mix C at -20°C for short-term stability

***alpha*-endosulfan in mix C**		
Date	**Concentration (2 ppm)**	**Day**
9.12.2022	1.82	0
15.12.2022	1.75	6
19.12.2022	1.74	10

$\bar{Y}$	1.77
$\bar{X}$	5

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1		
1.00	0	1.00	0		
$\bar{Y}$	b_1	$\bar{X}$	b_0		
1.77	0	5	1.77		
Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.82	1.77	0	0	0	2.74×10^{-3}
1.75	1.77	0	6	0	3.12×10^{-4}
1.74	1.77	0	10	0	1.20×10^{-3}
				Σ	4.26×10^{-3}
				s	6.52×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
1	1	1	6.52×10^{-2}	6.52×10^{-2}

$u_{sts}=t*s(b_1)$	0.65
%	65.0
tcrit. n-2 at 95 CL	12.7
tcrit. * $s(b_1)$	8.29×10^{-1}
|b1|	8.90×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.273. *beta*-Endosulfan in mix C at -20°C for short-term stability

***beta*-endosulfan in mix C**		
Date	**Concentration (2 ppm)**	**Day**
9.12.2022	1.88	0
15.12.2022	1.74	6
19.12.2022	1.69	10
$\bar{Y}$	1.77	
$\bar{X}$		5

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
1.00	2.22×10^{-16}	1.00	2.22×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.77	2.22×10^{-16}	5	1.77

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.88	1.77	2.22×10^{-16}	0	0	1.21×10^{-2}
1.74	1.77	2.22×10^{-16}	6	1.33×10^{-15}	7.77×10^{-4}
1.69	1.77	2.22×10^{-16}	10	2.22×10^{-15}	6.78×10^{-3}
				Σ	1.97×10^{-2}
				s	1.40×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
1	1	1	1.40×10^{-1}	1.40×10^{-1}

$u_{sts} = t * s(b_1)$	1.40
%	140.0
tcrit. n-2 at 95 CL	12.7
tcrit. * $s(b_1)$	1.78
|b1|	1.95×10^{-2}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.274. Heptachlor in mix C at -20°C for short-term stability

heptachlor in mix C		
Date	**Concentration (2 ppm)**	**Day**
9.12.2022	1.97	0
15.12.2022	2.74	6
19.12.2022	1.99	10
$\bar{Y}$	2.23	
$\bar{X}$		5

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1		
1.00	0	196	0		
$\bar{Y}$	b_1	$\bar{X}$	b_0		
2.23	0	5	2.23		
Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i-b_0-b_1*X_i)^2$
1.97	2.23	0	0	0	$6.74x10^{-2}$
2.74	2.23	0	6	0	$2.55x10^{-1}$
1.99	2.23	0	10	0	$6.02x10^{-2}$
				Σ	$3.82x10^{-1}$
				s	$6.18x10^{-1}$

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	$6.02x10^{-2}$	$4.30x10^{-3}$

$u_{sts}=t*s(b_1)$	6.18
%	618.0
tcrit. n-2 at 95 CL	12.7
tcrit. * $s(b_1)$	7.85
|b1|	$1.14x10^{-2}$
|b1| < tcrit.*$s(b_1)$	stable

Table 0.275. HCB in mixture I of mix B at -20°C for short-term stability

HCB in mixture I		
Date	**Concentration (2 ppm)**	**Day**
10.06.2023	2.05	0
19.06.2023	2.05	7
25.06.2023	2.04	14
03.07.2023	2.03	21
$\bar{Y}$	2.04	
$\bar{X}$		7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	0	196	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.04	0	7	2.04

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.05	2.04	0	0	0	8.24×10^{-5}
2.05	2.04	0	7	0	2.55×10^{-5}
2.04	2.04	0	14	0	3.11×10^{-5}
2.03	2.04	0	21	0	7.31×10^{-5}
				Σ	2.12×10^{-4}
				s	1.03×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	1.03×10^{-2}	7.36×10^{-4}

$u_{sts} = t * s(b_1)$	1.54×10^{-2}
%	1.54
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	3.16×10^{-3}
|b1|	9.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.276. Metolachlor in mixture I of mix B at -20°C for short-term stability

metolachlor in mixture I		
Date	**Concentration (2 ppm)**	**Day**
11.06.2023	2.29	0
19.06.2023	1.86	7
26.06.2023	2.08	14
03.07.2023	2.09	21
$\bar{Y}$	2.08	
$\bar{X}$	7	

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1		
14	4.44×10^{-16}	196	3.17×10^{-17}		
$\bar{Y}$	b_1	$\bar{X}$	b_0		
2.08	3.17×10^{-17}	7	2.08		
Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.29	2.08	3.17×10^{-17}	0	0	4.51×10^{-2}
1.86	2.08	3.17×10^{-17}	7	2.22×10^{-16}	4.84×10^{-2}
2.08	2.08	3.17×10^{-17}	14	4.44×10^{-16}	2.67×10^{-6}
2.09	2.08	3.17×10^{-17}	21	6.66×10^{-16}	8.64×10^{-5}
				Σ	9.37×10^{-2}
				s	2.16×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	2.16×10^{-1}	1.55×10^{-2}

$u_{sts} = t * s(b_1)$	3.25×10^{-1}
%	32.5
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	6.65×10^{-2}
|b1|	5.60×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.277. *alpha*-HCH in mixture II of mix B at -20°C for short-term stability

***alpha*-HCH in mixture II**		
Date	**Concentration (2 ppm)**	**Day**
11.06.2023	2.14	0
18.06.2023	2.01	7
25.06.2023	2.06	14
03.07.2023	2.01	21
$\bar{Y}$	2.06	
$\bar{X}$		7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	-1.33×10^{-15}	196	-9.52×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.06	-9.52×10^{-17}	7	2.06

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.14	2.06	-9.52×10^{-17}	0	0	7.36×10^{-3}
2.01	2.06	-9.52×10^{-17}	7	-6.66×10^{-16}	1.80×10^{-3}
2.06	2.06	-9.52×10^{-17}	14	-1.33×10^{-15}	1.55×10^{-5}
2.01	2.06	-9.52×10^{-17}	21	-1.99×10^{-15}	2.24×10^{-3}
				Σ	1.14×10^{-2}
				s	7.55×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	7.55x10-2	5.40×10^{-3}

$u_{sts} = t * s(b_1)$	1.13×10^{-1}
%	11.3
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	2.32×10^{-2}
|b1|	5.00×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.278. *gamma*-HCH in mixture II of mix B at -20°C for short-term stability

***gamma*-HCH in mixture II**		
Date	**Concentration (2 ppm)**	**Day**
10.06.2023	2.06	0
18.06.2023	2.08	7
25.06.2023	2.03	14
03.07.2023	1.82	21
$\bar{Y}$	2.00	
$\bar{X}$		7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	-2.22×10^{-16}	196	-1.59×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.00	-1.59×10^{-17}	7	2.00

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.06	2.00	-1.59×10^{-17}	0	0	3.74×10^{-3}
2.03	2.00	-1.59×10^{-17}	7	-1.11×10^{-16}	1.23×10^{-3}
2.00	2.00	-1.59×10^{-17}	14	-2.22×10^{-16}	3.99×10^{-5}
2.06	2.00	-1.59×10^{-17}	21	-3.33×10^{-16}	3.90×10^{-3}
				Σ	8.91×10^{-3}
				s	6.68×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	6.68×10^{-2}	4.77×10^{-3}

$u_{sts} = t * s(b_1)$	1.00×10^{-1}
%	10.0
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	2.05×10^{-2}
|b1|	1.12×10^{-2}
$\|b1\| < tcrit. * s(b_1)$	Stable

Table 0.279. Aldrin in mixture II of mix B at -20°C for short-term stability

aldrin in mixture II		
Date	**Concentration (2 ppm)**	**Day**
11.06.2023	2.04	0
18.06.2023	2.06	7
25.06.2023	2.04	14
03.07.2023	1.84	21
$\bar{Y}$	2.00	
$\bar{X}$		7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	4.44×10^{-16}	196	3.17×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.00	3.17×10^{-17}	7	2.00

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.04	2.00	3.17×10^{-17}	0	0	1.96×10^{-3}
2.06	2.00	3.17×10^{-17}	7	2.22x10-16	4.09×10^{-3}
2.04	2.00	3.17×10^{-17}	14	4.44x10-16	2.44×10^{-3}
1.84	2.00	3.17×10^{-17}	21	6.66x10-16	2.48×10^{-2}
				Σ	7.24×10^{-3}
				s	6.02×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	1.29×10^{-1}	9.22×10^{-3}

$u_{sts}=t*s(b_1)$	1.94×10^{-1}
%	19.4
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	3.97×10^{-2}
|b1|	8.90×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.280. Dieldrin in mixture II of mix B at -20°C for short-term stability

dieldrin in mixture II		
Date	**Concentration (2 ppm)**	**Day**
10.06.2023	2.06	0
18.06.2023	2.03	7
25.06.2023	2.05	14
03.07.2023	2.03	21

$\bar{Y}$	2.05
$\bar{X}$	7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	0	196	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.05	0	7	2.05

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.06	2.05	0	0	0	3.36×10^{-4}
2.03	2.05	0	7	0	1.53×10^{-4}
2.05	2.05	0	14	0	3.79×10^{-5}
2.03	2.05	0	21	0	1.47×10^{-4}
				Σ	6.74×10^{-4}
				s	1.84×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	1.84×10^{-2}	1.31×10^{-3}

$u_{sts}=t*s(b_1)$	2.75×10^{-2}
%	2.75
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	5.64×10^{-3}
|b1|	1.00×10^{-3}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.281. Endrin in mixture II of mix B at -20°C for short-term stability

endrin in mixture II		
Date	**Concentration (2 ppm)**	**Day**
10.06.2023	2.08	0
18.06.2023	2.08	7
25.06.2023	2.09	14
03.07.2023	2.10	21
$\bar{Y}$	2.08	
$\bar{X}$		7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	-4.44×10^{-16}	196	-3.17×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.08	-3.17×10^{-17}	7	2.08

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.08	2.08	-3.17×10^{-17}	0	0	6.29×10^{-5}
2.08	2.08	-3.17×10^{-17}	7	-2.22×10^{-16}	6.72×10^{-5}
2.09	2.08	-3.17×10^{-17}	14	-4.44×10^{-16}	2.72×10^{-6}
2.10	2.08	-3.17×10^{-17}	21	-6.66×10^{-16}	2.10×10^{-4}
				Σ	3.43×10^{-4}
				s	1.31×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	1.31×10^{-2}	9.35×10^{-4}

$u_{sts}=t*s(b_1)$	1.96×10^{-2}
%	1.96
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	4.02×10^{-3}
|b1|	1.10×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.282. 4,4'-DDD in mixture II of mix B at -20°C for short-term stability

4,4'-DDD in mixture II		
Date	**Concentration (2 ppm)**	**Day**
10.06.2023	2.01	0
18.06.2023	2.10	7
25.06.2023	2.02	14
03.07.2023	1.96	21
$\bar{Y}$	2.02	
$\bar{X}$		7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	-4.44×10^{-16}	196	-3.17×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.02	-3.17×10^{-17}	7	2.02

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.01	2.02	-3.17×10^{-17}	0	0	1.08×10^{-4}
2.10	2.02	-3.17×10^{-17}	7	-2.2×10^{-16}	5.49×10^{-3}
2.02	2.02	-3.17×10^{-17}	14	-4.4×10^{-16}	3.21×10^{-5}
1.96	2.02	-3.17×10^{-17}	21	-6.7×10^{-16}	3.37×10^{-3}
				Σ	9.00×10^{-3}
				s	6.71×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	6.71×10^{-2}	4.79×10^{-3}

$u_{sts} = t * s(b_1)$	1.01×10^{-1}
%	10.06
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	2.06×10^{-2}
$\|b1\|$	3.20×10^{-3}
$\|b1\| < tcrit. * s(b_1)$	Stable

Table 0.283. 4,4'-DDT in mixture II of mix B at -20°C for short-term stability

4,4'-DDT in mixture I		
Date	**Concentration (2 ppm)**	**Day**
10.06.2023	2.06	0
18.06.2023	2.02	7
25.06.2023	2.01	14
03.07.2023	1.95	21
$\bar{Y}$	2.01	
$\bar{X}$		7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	6.66×10^{-16}	196	4.76×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.01	4.76×10^{-17}	7	2.01

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.06	2.01	4.76×10^{-17}	0	0	2.29×10^{-3}
2.02	2.01	4.76×10^{-17}	7	3.33×10^{-16}	4.88×10^{-5}
2.01	2.01	4.76×10^{-17}	14	6.66×10^{-16}	4.19×10^{-6}
1.95	2.01	4.76×10^{-17}	21	9.99×10^{-16}	3.24×10^{-3}
				Σ	5.58×10^{-3}
				s	5.28×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	5.28×10^{-2}	3.77×10^{-3}

$u_{sts} = t * s(b_1)$	7.93×10^{-2}
%	7.93
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.62×10^{-2}
|b1|	4.60×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.284. 2,4'-DDT in mixture II of mix B at -20°C for short-term stability

2,4'-DDT in mixture II		
Date	**Concentration (2 ppm)**	**Day**
10.06.2023	2.15	0
18.06.2023	2.17	7
25.06.2023	2.15	14
03.07.2023	2.17	21
$\bar{Y}$	2.16	
$\bar{X}$		7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	8.88×10^{-16}	196	6.34×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.16	6.34×10^{-17}	7	2.16

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.15	2.16	6.34×10^{-17}	0	0	1.06×10^{-4}
2.17	2.16	6.34×10^{-17}	7	4.44×10^{-16}	8.24×10^{-5}
2.15	2.16	6.34×10^{-17}	14	8.88×10^{-16}	7.79×10^{-5}
2.17	2.16	6.34×10^{-17}	21	1.33×10^{-15}	1.01×10^{-4}
				Σ	3.67×10^{-4}
				s	1.35×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	1.35×10^{-02}	9.68×10^{-4}

$u_{sts} = t * s(b_1)$	2.03×10^{-2}
%	2.03
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	4.16×10^{-3}
|b1|	6.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.285. *alpha*-Endosulfan in mixture II of mix B at -20°C for short-term stability

***alpha*-endosulfan in mixture II**		
Date	**Concentration (2 ppm)**	**Day**
1.06.2023	2.02	0
18.06.2023	2.05	7
25.06.2023	2.02	14
03.07.2023	1.66	21
$\bar{Y}$	1.94	
$\bar{X}$		7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	1.11×10^{-15}	196	7.93×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.94	7.93×10^{-17}	7	1.94

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.02	1.94	7.93×10^{-17}	0	0	7.64×10^{-3}
2.05	1.94	7.93×10^{-17}	7	5.55×10^{-16}	1.22×10^{-2}
2.02	1.94	7.93×10^{-17}	14	1.11×10^{-15}	6.16×10^{-3}
1.66	1.94	7.93×10^{-17}	21	1.67×10^{-15}	7.64×10^{-2}
				Σ	1.02×10^{-1}
				s	2.26×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	2.26×10^{-1}	1.62×10^{-2}

$u_{sts} = t * s(b_1)$	3.39×10^{-1}
%	33.9
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	6.95×10^{-2}
|b1|	1.60×10^{-2}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.286. *beta*-Endosulfan in mixture II of mix B at -20°C for short-term stability

***beta*-endosulfan in mixture II**		
Date	**Concentration (2 ppm)**	**Day**
10.06.2023	2.02	0
18.06.2023	2.05	7
25.06.2023	2.01	14
03.07.2023	1.83	21
$\bar{Y}$	1.98	
$\bar{X}$		7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	-8.88×10^{-16}	196	-6.34×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.98	-6.34×10^{-17}	7	1.98

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.02	1.98	-6.34×10^{-17}	0	0	2.08×10^{-3}
2.05	1.98	-6.34×10^{-17}	7	-4.44×10^{-16}	5.22×10^{-3}
2.01	1.98	-6.34×10^{-17}	14	-8.88×10^{-16}	1.27×10^{-3}
1.83	1.98	-6.34×10^{-17}	21	-1.33×10^{-15}	2.36×10^{-2}
				Σ	3.21×10^{-2}
				s	1.27×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	1.27×10^{-1}	9.06×10^{-3}

$u_{sts} = t * s(b_1)$	1.90×10^{-1}
%	19.0
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	3.89×10^{-2}
|b1|	9.10×10^{-3}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.287. Heptachlor in mixture II of mix B at -20°C for short-term stability

heptachlor in mixture II		
Date	**Concentration (2 ppm)**	**Day**
10.06.2023	2.02	0
18.06.2023	2.02	7
25.06.2023	2.05	14
$\bar{Y}$	2.00	
$\bar{X}$		7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
7	-2.22×10^{-16}	49	-3.17×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.00	-3.17×10^{-17}	7	2.00

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.02	2.00	-3.17×10^{-17}	0	0	6.72×10^{-4}
2.02	2.00	-3.17×10^{-17}	7	-2.22×10^{-16}	6.24×10^{-4}
1.95	2.00	-3.17×10^{-17}	14	-4.44×10^{-16}	2.59×10^{-3}
				Σ	3.89×10^{-3}
				s	6.23×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
7	49	7	6.23×10^{-2}	8.91×10^{-3}

$u_{sts} = t * s(b_1)$	1.25×10^{-1}
%	12.5
tcrit. n-2 at 95 CL	12.7
tcrit. * $s(b_1)$	1.13×10^{-1}
|b1|	5.50×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.288. Heptachlor-*endo*-epoxide in mixture II of mix B at -20°C for short-term stability

heptachlor-*endo*-epoxide in mixture II		
Date	**Concentration (2 ppm)**	**Day**
10.06.2023	2.04	0
18.06.2023	2.04	7
25.06.2023	2.01	14
03.07.2023	1.98	21
$\bar{Y}$	2.02	
$\bar{X}$		7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	$1.11x10^{-15}$	196	$7.93x10^{-17}$
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.02	$7.93x10^{-17}$	7	2.02

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i-b_0-b_1*X_i)^2$
2.04	2.02	$7.93x10^{-17}$	0	0	$4.63x10^{-4}$
2.04	2.02	$7.93x10^{-17}$	7	$5.55x10^{-16}$	$5.79x10^{-4}$
2.01	2.02	$7.93x10^{-17}$	14	$1.11x10^{-15}$	$9.43x10^{-5}$
1.98	2.02	$7.93x10^{-17}$	21	$1.67x10^{-15}$	$1.29x10^{-3}$
				Σ	$2.42x10^{-3}$
				s	$3.48x10^{-2}$

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	$3.48x10^{-2}$	$2.49x10^{-3}$

$u_{sts}=t*s(b_1)$	$5.22x10^{-2}$
%	5.22
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	$1.07x10^{-2}$
|b1|	$2.90x10^{-3}$
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.289. HCB in mixture I of mix A at 20°C for short-term stability

HCB in mixture I		
Date	**Concentration (2 ppm)**	**Day**
23.10.2023	2.00	0
24.10.2023	1.70	1
25.10.2023	1.66	2
15.11.2023	2.07	3
$\bar{Y}$	1.86	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
2	0	4.00	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.86	0	1	1.86

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.00	1.86	0	0	0	2.19×10^{-2}
1.70	1.86	0	1	0	2.57×10^{-2}
1.66	1.86	0	2	0	3.89×10^{-2}
2.07	1.86	0	3	0	4.40×10^{-2}
				Σ	1.30×10^{-1}
				s	2.55×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
2	4	2	2.55×10^{-1}	1.28×10^{-1}

$u_{sts} = t * s(b_1)$	3.83×10^{-1}
%	38.3
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	0.5491
|b1|	1.48×10^{-2}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.290. Metolachlor in mixture I of mix A at 20°C for short-term stability

metolachlor in mixture I		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.11	0
24.08.2023	2.03	1
27.08.2023	2.03	2
29.08.2023	1.76	4
$\bar{Y}$	1.99	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
3	-4.44×10^{-16}	9	-1.48×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.99	-1.48×10^{-16}	1	1.99

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.11	1.99	-1.48×10^{-16}	0	0	1.66×10^{-2}
2.03	1.99	-1.48×10^{-16}	7	-1.04×10^{-15}	1.95×10^{-3}
2.03	1.99	-1.48×10^{-16}	14	-2.07×10^{-15}	2.28×10^{-3}
1.76	1.99	-1.48×10^{-16}	21	-3.11×10^{-15}	4.87×10^{-2}
				Σ	6.95×10^{-2}
				s	1.86×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
3	9	3	1.86x10-1	6.22×10^{-2}

$u_{sts} = t * s(b_1)$	2.49×10^{-1}
%	24.9
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	2.67×10^{-1}
|b1|	8.49×10^{-2}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.291. *alpha*-HCH in mixture II of mix A at 20°C for short-term stability

***alpha*-HCH in mixture II**		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.07	0
24.08.2023	1.98	1
25.08.2023	2.03	2
27.08.2023	2.03	3
29.08.2023	2.07	4
$\bar{Y}$	2.04	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
5	-1.33×10^{-15}	25	-2.66×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.04	-2.66×10^{-16}	1	2.04

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.07	2.04	-2.66x10-16	0	0	1.19×10^{-3}
1.98	2.04	-2.66x10-16	1	-2.66×10^{-16}	2.76×10^{-3}
2.03	2.04	-2.66x10-16	2	-5.33×10^{-16}	6.26×10^{-5}
2.03	2.04	-2.66x10-16	3	-7.99×10^{-16}	7.08×10^{-5}
2.07	2.04	-2.66x10-16	4	-1.07×10^{-15}	1.18×10^{-3}
				Σ	4.08×10^{-3}
				s	3.69×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	**s(b_1)**
5	25	5	3.69×10^{-2}	7.37×10^{-3}

$u_{sts}=t*s(b_1)$	2.95×10^{-2}
%	2.95
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	2.35×10^{-2}
|b1|	4.40×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.292. *gamma*-HCH in mixture II of mix A at 20°C for short-term stability

***gamma*-HCH in mixture II**		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	1.96	0
24.08.2023	1.89	1
25.08.2023	1.98	2
27.08.2023	1.96	3
29.08.2023	1.99	4
$\bar{Y}$	1.96	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
5	4.44×10^{-16}	25	8.88×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.96	8.88x10-17	1	1.96

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.96	1.96	8.88×10^{-17}	0	0	1.74×10^{-6}
1.89	1.96	8.88×10^{-17}	1	8.88×10^{-17}	4.27×10^{-3}
1.98	1.96	8.88×10^{-17}	2	1.77×10^{-16}	5.28×10^{-4}
1.96	1.96	8.88×10^{-17}	3	2.66×10^{-16}	8.24×10^{-6}
1.99	1.96	8.88×10^{-17}	4	3.55×10^{-16}	1.46×10^{-3}
				Σ	4.81×10^{-3}
				s	4.00×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
5	25	5	4.00×10^{-2}	8.01×10^{-3}

$u_{sts}=t*s(b_1)$	3.20×10^{-2}
%	3.20
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	2.55×10^{-2}
|b1|	1.42×10^{-2}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.293. Aldrin in mixture II of mix A at 20°C for short-term stability

aldrin in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	1.90	0
24.08.2023	1.89	1
25.08.2023	1.92	2
27.08.2023	1.94	3
29.08.2023	1.84	4
$\bar{Y}$	1.90	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
5	-8.88×10^{-16}	25	-1.78×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.90	-1.78×10^{-16}	1	1.90

Y_i	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.90	1.90	-1.78×10^{-16}	0	0	4.06×10^{-5}
1.89	1.90	-1.78×10^{-16}	1	-1.78×10^{-16}	6.77×10^{-5}
1.92	1.90	-1.78×10^{-16}	2	-3.55×10^{-16}	4.02×10^{-4}
1.94	1.90	-1.78×10^{-16}	3	-5.33×10^{-16}	1.42×10^{-3}
1.84	1.90	-1.78×10^{-16}	4	-7.11×10^{-16}	3.12×10^{-3}
				Σ	1.93×10^{-3}
				s	2.54×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
5	25	5	2.54×10^{-2}	5.07×10^{-3}

$u_{sts} = t * s(b_1)$	2.03×10^{-2}
%	2.03
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	1.61×10^{-2}
$\lvert b1 \rvert$	7.90×10^{-3}
$\lvert b1 \rvert <$ tcrit.*$s(b_1)$	stable

Table 0.294. Dieldrin in mixture II of mix A at 20°C for short-term stability

dieldrin in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.08	0
24.08.2023	2.05	1
25.08.2023	2.08	2
27.08.2023	2.06	3
29.08.2023	2.05	4
$\bar{Y}$	2.22	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
5	-8.88×10^{-16}	25	-1.78×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.07	-1.78×10^{-16}	1	2.07

Y_i	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.08	2.07	-1.78×10^{-16}	0	0	3.40×10^{-4}
2.05	2.07	-1.78×10^{-16}	1	-1.78×10^{-16}	1.65×10^{-4}
2.08	2.07	-1.78×10^{-16}	2	-3.55×10^{-16}	2.83×10^{-4}
2.06	2.07	-1.78×10^{-16}	3	-5.33×10^{-16}	4.62×10^{-5}
2.05	2.07	-1.78×10^{-16}	4	-7.11×10^{-16}	2.45×10^{-4}
				Σ	8.34×10^{-4}
				s	1.67×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
5	25	5	1.67×10^{-2}	3.34×10^{-3}

$u_{sts} = t * s(b_1)$	1.33×10^{-2}
%	1.33
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	1.06×10^{-2}
$\|b1\|$	6.20×10^{-3}
$\|b1\| < tcrit. * s(b_1)$	Stable

Table 0.295. Endrin in mixture II of mix A at 20°C for short-term stability

endrin in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.04	0
24.08.2023	2.00	1
25.08.2023	2.06	2
27.08.2023	2.07	3
$\bar{Y}$	2.05	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
2	0	4	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.05	0	1	2.05

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.04	2.05	0	0	0	3.69×10^{-5}
2.00	2.05	0	1	0	1.71×10^{-3}
2.06	2.05	0	2	0	3.27×10^{-4}
2.07	2.05	0	3	0	8.62×10^{-4}
				Σ	2.93×10^{-3}
				s	3.83×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
2	4	2	3.83×10^{-2}	1.92×10^{-2}

$u_{sts} = t * s(b_1)$	5.75×10^{-2}
%	5.75
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	8.24×10^{-2}
|b1|	1.66×10^{-2}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.296. 4,4'-DDD in mixture II of mix A at 20°C for short-term stability

4,4'-DDD in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	1.91	0
24.08.2023	1.84	1
25.08.2023	1.94	2
27.08.2023	1.95	3
29.08.2023	1.78	4

$\bar{Y}$	1.88
$\bar{X}$	1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
145	-4.44×10^{-16}	25	-8.88×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.88	-8.88×10^{-17}	1	1.88

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.91	1.88	-8.88×10^{-17}	0	0	7.56×10^{-4}
1.84	1.88	-8.88×10^{-17}	1	-8.88×10^{-17}	2.19×10^{-3}
1.94	1.88	-8.88×10^{-17}	2	-1.78×10^{-16}	2.80×10^{-3}
1.95	1.88	-8.88×10^{-17}	3	-2.66×10^{-16}	4.32×10^{-3}
1.78	1.88	-8.88×10^{-17}	4	-3.55×10^{-16}	9.87×10^{-3}
				Σ	1.01×10^{-2}
				s	5.79×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
5	25	5	5.79×10^{-2}	1.16×10^{-2}

$u_{sts} = t * s(b_1)$	4.63×10^{-2}
%	4.63
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	3.68×10^{-2}
|b1|	1.41×10^{-2}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.297. 4,4'-DDT in mixture II of mix A at 20°C for short-term stability

4,4'-DDT in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.34	0
24.08.2023	2.43	1
25.08.2023	2.56	2
27.08.2023	2.57	3
29.08.2023	2.70	4
$\bar{Y}$	2.52	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
5	-1.78×10^{-15}	25	-3.55×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.52	-3.55×10^{-16}	1	2.52

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.34	2.52	-3.55×10^{-16}	0	0	3.30×10^{-2}
2.43	2.52	-3.55×10^{-16}	1	-3.55×10^{-16}	8.29×10^{-3}
2.56	2.52	-3.55×10^{-16}	2	-7.11×10^{-16}	1.60×10^{-3}
2.57	2.52	-3.55×10^{-16}	3	-1.07×10^{-15}	2.74×10^{-3}
2.70	2.52	-3.55×10^{-16}	4	-1.42×10^{-15}	3.25×10^{-2}
				Σ	4.56×10^{-2}
				s	1.23×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
5	25	5	1.23×10^{-1}	2.47×10^{-2}

$u_{sts} = t * s(b_1)$	9.86×10^{-2}
%	9.86
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	7.84×10^{-2}
|b1|	8.67×10^{-2}
|b1| < tcrit.*$s(b_1)$	accept as stable

Table 0.298. 2,4- ‘DDT in mixture II of mix A at 20°C for short-term stability

2,4’-DDT in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.06	0
24.08.2023	2.04	1
25.08.2023	2.08	2
27.08.2023	2.06	3
$\bar{Y}$	2.06	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
2	0	4	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.06	0	1	2.06

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.06	2.06	0	0	0	1.70×10^{-6}
2.04	2.06	0	1	0	4.91×10^{-4}
2.08	2.06	0	2	0	6.83×10^{-4}
2.06	2.06	0	3	0	7.20×10^{-6}
				Σ	1.18×10^{-3}
				s	2.43×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
2	4	2	2.43×10^{-2}	1.22×10^{-2}

$u_{sts}=t*s(b_1)$	3.65×10^{-2}
%	3.65
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	5.23×10^{-2}
|b1|	7.20×10^{-3}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.299. *alpha*-Endosulfan in mixture II of mix A at 20°C for short-term stability

***alpha*-endosulfan in mixture II**		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.03	0
24.08.2023	2.02	1
25.08.2023	2.01	2
27.08.2023	2.02	3
$\bar{Y}$	2.02	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
2	-8.88×10^{-16}	4	-4.44×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.02	-4.44×10^{-16}	1	2.02

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.03	2.02	-4.44×10^{-16}	0	0	1.67×10^{-4}
2.02	2.02	-4.44×10^{-16}	1	-4.44×10^{-16}	8.84×10^{-6}
2.01	2.02	-4.44×10^{-16}	2	-8.88×10^{-16}	7.33×10^{-5}
2.02	2.02	-4.44×10^{-16}	3	-1.33×10^{-15}	1.97×10^{-6}
				Σ	2.51×10^{-4}
				s	1.12×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
14	196	14	6.02×10^{-2}	4.30×10^{-3}

$u_{sts} = t * s(b_1)$	1.68×10^{-2}
%	1.68
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	2.41×10^{-2}
|b1|	4.90×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.300. *beta*-Endosulfan in mixture II of mix A at 20°C for short-term stability

***beta*-endosulfan in mixture II**		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.11	0
24.08.2023	2.04	1
25.08.2023	2.10	2
27.08.2023	2.16	3
29.08.2023	2.02	4
$\bar{Y}$	2.08	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
5	-8.88×10^{-16}	25	-1.78×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.08	-1.78×10^{-16}	1	2.08

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.11	2.08	-1.78×10^{-16}	0	0	6.24×10^{-4}
2.04	2.08	-1.78×10^{-16}	1	-1.78×10^{-16}	2.18×10^{-3}
2.10	2.08	-1.78×10^{-16}	2	-3.55×10^{-16}	3.01×10^{-4}
2.16	2.08	-1.78×10^{-16}	3	-5.33×10^{-16}	5.30×10^{-3}
2.02	2.08	-1.78×10^{-16}	4	-7.11×10^{-16}	4.68×10^{-3}
				Σ	8.40×10^{-3}
				s	5.29×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
5	25	5	5.29×10^{-2}	1.06×10^{-2}

$u_{sts}=t*s(b_1)$	4.23×10^{-2}
%	4.23
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	3.37×10^{-2}
|b1|	6.70×10^{-3}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.301. Heptachlor in mixture II of mix A at 20°C for short-term stability

heptachlor in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.10	0
24.08.2023	1.92	1
25.08.2023	2.08	2
27.08.2023	2.08	3
29.08.2023	2.00	4
$\bar{Y}$	2.03	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
5	2.22×10^{-15}	25	4.44×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.03	4.44×10^{-16}	1	2.03

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.10	2.03	4.44×10^{-16}	0	0	4.05×10^{-3}
1.92	2.03	4.44×10^{-16}	1	4.44×10^{-16}	1.40×10^{-2}
2.08	2.03	4.44×10^{-16}	2	8.88×10^{-16}	2.36×10^{-3}
2.08	2.03	4.44×10^{-16}	3	1.33×10^{-15}	1.69×10^{-3}
2.00	2.03	4.44×10^{-16}	4	1.78×10^{-15}	1.22×10^{-3}
				Σ	2.21×10^{-2}
				s	8.59×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
5	25	5	8.59×10^{-2}	1.72×10^{-2}

$u_{sts}=t*s(b_1)$	6.87×10^{-2}
%	6.87
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	7.38×10^{-2}
|b1|	3.70×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.302. Heptachlor-*endo*-epoxide in mixture II of mix A at 20°C for short-term stability

heptachlor-*endo*-epoxide in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.09	0
24.08.2023	2.00	1
25.08.2023	2.05	2
27.08.2023	2.06	3
$\bar{Y}$	2.05	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
2	0	4	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.05	0	1	2.05

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.09	2.05	0	0	0	1.19×10^{-3}
2.00	2.05	0	1	0	2.12×10^{-3}
2.05	2.05	0	2	0	1.76×10^{-7}
2.06	2.05	0	3	0	1.44×10^{-4}
				Σ	3.45×10^{-3}
				s	4.15×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	**s(b_1)**
2	4	2	4.15×10^{-2}	2.08×10^{-2}

$u_{sts}=t*s(b_1)$	6.23×10^{-2}
%	6.23
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	8.93×10^{-2}
|b1|	2.20×10^{-3}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.303. HCB in mixture I of mix B at 20°C for short-term stability

HCB in mixture I		
Date	**Concentration (2 ppm)**	**Day**
23.10.2023	1.96	0
24.10.2023	2.09	1
25.10.2023	1.67	2
15.11.2023	2.02	18
$\bar{Y}$	1.93	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	2.22×10^{-16}	289	1.31×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.93	1.31×10^{-17}	1	1.93

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.96	1.93	1.31×10^{-17}	0	0	4.31×10^{-4}
2.09	1.93	1.31×10^{-17}	1	1.31×10^{-17}	2.29×10^{-2}
1.67	1.93	1.31×10^{-17}	2	2.61×10^{-17}	6.85×10^{-2}
2.02	1.93	1.31×10^{-17}	18	2.35×10^{-16}	8.02×10^{-3}
				Σ	9.99×10^{-2}
				s	2.23×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	2.23×10^{-1}	1.31×10^{-2}

$u_{sts} = t * s(b_1)$	2.37×10^{-1}
%	23.66
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	5.65×10^{-2}
|b1|	5.70×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.304. Metolachlor in mixture I of mix B at 20°C for short-term stability

metolachlor in mixture I		
Date	**Concentration (2 ppm)**	**Day**
23.10.2023	2.30	0
24.10.2023	2.34	1
25.10.2023	2.69	2
15.11.2023	3.08	18
$\bar{Y}$	2.60	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	0	289	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.60	0	1	2.60

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.30	2.60	0	0	0	9.38×10^{-2}
2.34	2.60	0	1	0	6.81×10^{-2}
2.69	2.60	0	2	0	8.32×10^{-3}
3.08	2.60	0	18	0	2.27×10^{-1}
				Σ	3.97×10^{-1}
				s	4.45×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	4.45×10^{-1}	2.62×10^{-2}

$u_{sts} = t * s(b_1)$	4.72×10^{-1}
%	47.16
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	0.11
|b1|	3.88×10^{-2}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.305. *alpha*-HCH in mixture II of mix B at 20°C for short-term stability

***alpha*-HCH in mixture II**		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.08	0
24.08.2023	2.03	1
25.08.2023	2.06	2
27.08.2023	2.05	4
$\bar{Y}$	1.93	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
3	4.44×10^{-16}	9.00	1.48×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.05	1.48×10^{-16}	1	2.05

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.08	2.05	1.48×10^{-16}	0	0	5.85×10^{-4}
2.03	2.05	1.48×10^{-16}	1	1.48×10^{-16}	6.74×10^{-4}
2.06	2.05	1.48×10^{-16}	2	2.96×10^{-16}	1.04×10^{-5}
2.05	2.05	1.48×10^{-16}	4	5.92×10^{-16}	2.09×10^{-6}
				Σ	1.27×10^{-3}
				s	2.52×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
3	9	9.00	2.52×10^{-2}	2.80×10^{-3}

$u_{sts} = t * s(b_1)$	1.12×10^{-2}
%	1.12
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.20×10^{-2}
|b1|	2.90×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.306. *gamma*-HCH in mixture II of mix B at 20°C for short-term stability

***gamma*-HCH in mixture I**		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	1.88	0
24.08.2023	1.94	1
27.08.2023	1.88	4
29.08.2023	1.81	6
$\bar{Y}$	1.88	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
7	-4.44×10^{-16}	49	-6.34×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.88	-6.34×10^{-17}	1	1.88

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.88	1.88	-6.34×10^{-17}	0	0	5.13×10^{-6}
1.94	1.88	-6.34×10^{-17}	1	-6.34×10^{-17}	3.97×10^{-3}
1.88	1.88	-6.34×10^{-17}	4	-2.54×10^{-16}	8.56×10^{-7}
1.81	1.88	-6.34×10^{-17}	6	-3.81×10^{-16}	4.38×10^{-3}
				Σ	8.35×10^{-3}
				s	6.46×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
7	49	7	6.46×10^{-2}	9.23×10^{-3}

$u_{sts}=t*s(b_1)$	5.54×10^{-2}
%	5.54
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	3.97×10^{-2}
|b1|	2.67×10^{-2}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.307. Aldrin in mixture II of mix B at 20°C for short-term stability

aldrin in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.10.2023	2.09	0
24.10.2023	1.97	1
25.10.2023	1.99	2
15.11.2023	2.02	18
$\bar{Y}$	2.02	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	8.88×10^{-16}	289	5.22×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.02	5.22×10^{-17}	1	2.02

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.09	2.02	5.225×10^{-17}	0	0	4.92×10^{-3}
1.97	2.02	5.225×10^{-17}	1	5.22×10^{-17}	1.96×10^{-3}
1.99	2.02	5.225×10^{-17}	2	1.04×10^{-16}	5.47×10^{-4}
2.02	2.02	5.225×10^{-17}	18	9.4×10^{-16}	5.98×10^{-6}
				Σ	7.24×10^{-3}
				s	6.02×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	6.10×10^{-2}	3.59×10^{-3}

$u_{sts} = t * s(b_1)$	6.46×10^{-2}
%	6.46
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.54×10^{-2}
|b1|	6.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.308. Dieldrin in mixture II of mix B at 20°C for short-term stability

dieldrin in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.02	0
24.08.2023	1.89	1
27.08.2023	2.04	4
29.08.2023	2.08	6
$\bar{Y}$	2.01	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
7	0	49	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.01	0	1	2.01

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.02	2.01	0	0	0	2.04×10^{-4}
1.89	2.01	0	1	0	1.49×10^{-2}
2.04	2.01	0	4	0	1.22×10^{-3}
2.08	2.01	0	6	0	5.32×10^{-3}
				Σ	2.17×10^{-2}
				s	1.04×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
7	49	7	1.04×10^{-1}	1.49×10^{-2}

$u_{sts} = t * s(b_1)$	8.92×10^{-2}
%	8.92
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	6.39×10^{-2}
|b1|	2.00×10^{-2}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.309. Endrin in mixture II of mix B at 20°C for short-term stability

endrin in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.01	0
24.08.2023	2.03	1
27.08.2023	2.09	4
29.08.2023	2.05	6
$\bar{Y}$	2.04	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
7	4.44×10^{-16}	49	6.34×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.04	6.34×10^{-17}	1	2.04

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.01	2.04	6.34×10^{-17}	0	0	1.10×10^{-3}
2.03	2.04	6.34×10^{-17}	1	6.34×10^{-17}	1.23×10^{-4}
2.09	2.04	6.34×10^{-17}	4	2.54×10^{-16}	1.79×10^{-3}
2.05	2.04	6.34×10^{-17}	6	3.81×10^{-16}	3.76×10^{-6}
				Σ	3.02×10^{-3}
				s	3.89×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
7	49	7	3.89×10^{-2}	5.55×10^{-3}

$u_{sts} = t * s(b_1)$	3.33×10^{-2}
%	3.33
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	2.39×10^{-2}
|b1|	7.50×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.310. 4,4'-DDD in mixture I of mix B at 20°C for short-term stability

4,4'-DDD in mixture II		
Date	**Concentration (2 ppm)**	**Day**
24.08.2023	2.05	1
25.08.2023	2.07	2
27.08.2023	2.08	4
29.08.2023	2.02	6
$\bar{Y}$	2.05	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
9	$4.44x10^{-16}$	81.00	$4.93x10^{-17}$
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.05	$4.93x10^{-17}$	1	2.05

Yi	**b_0**	**b_1**	**X_i**	**$b_1 * X_i$**	**$(Y_i-b_0-b_1*X_i)^2$**
2.05	2.05	$4.93x10^{-17}$	1	$4.93x10^{-17}$	$1.49x10^{-6}$
2.07	2.05	$4.93x10^{-17}$	2	$9.87x10^{-17}$	$2.22x10^{-4}$
2.08	2.05	$4.93x10^{-17}$	4	$1.97x10^{-16}$	$5.63x10^{-4}$
2.02	2.05	$4.93x10^{-17}$	6	$2.96x10^{-16}$	$1.40x10^{-3}$
				Σ	$2.19x10^{-3}$
				s	$3.31x10^{-2}$

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	**$s(b_1)$**
9	81	9	$3.31x10^{-2}$	$3.67x10^{-3}$

$u_{sts}=t*s(b_1)$	$2.20x10^{-2}$
%	2.20
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	$1.58x10^{-2}$
|b1|	$6.80x10^{-3}$
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.311. 4,4’-DDT in mixture II of mix B at 20°C for short-term stability

4,4’-DDT in mixture I		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.49	0
25.08.2023	2.69	2
27.08.2023	2.68	4
29.08.2023	2.57	6
$\bar{Y}$	2.61	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
8	-4.44×10^{-16}	64.00	-5.6×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.61	-5.55×10^{-17}	1	2.61

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.49	2.61	-5.6×10^{-17}	0	0	1.43×10^{-2}
2.69	2.61	-5.6×10^{-17}	2	-1.1×10^{-16}	7.66×10^{-3}
2.68	2.61	-5.6×10^{-17}	4	-2.2×10^{-16}	5.16×10^{-3}
2.57	2.61	-5.6×10^{-17}	6	-3.3×10^{-16}	1.59×10^{-3}
				Σ	2.87×10^{-2}
				s	1.20×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
8	64	8	1.20×10^{-1}	1.50×10^{-2}

$u_{sts} = t * s(b_1)$	8.98×10^{-2}
%	8.98
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	6.44×10^{-2}
|b1|	1.12×10^{-2}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.312. 2,4'-DDT in mixture II of mix B at 20°C for short-term stability

2,4'-DDT in mixture II		
Date	**Concentration (2 ppm)**	**Day**
24.08.2023	1.92	1
25.08.2023	1.84	2
27.08.2023	1.88	4
29.08.2023	1.75	6
$\bar{Y}$	1.85	
$\bar{X}$		7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
9	0	81	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.85	0	1	1.85

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.92	1.85	0	1	0	4.66×10^{-3}
1.84	1.85	0	2	0	4.18×10^{-5}
1.88	1.85	0	4	0	1.21×10^{-3}
1.75	1.85	0	6	0	9.32×10^{-3}
				Σ	1.52×10^{-2}
				s	8.73×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	**s(b_1)**
9	81	9	8.73×10^{-2}	9.70×10^{-3}

$u_{sts}=t*s(b_1)$	5.82×10^{-2}
%	5.82
tcrit. n-2 at 95 CL	4.3
tcrit. * s(b_1)	4.17×10^{-2}
|b1|	2.61×10^{-2}
|b1| < tcrit.*s(b_1)	Stable

Table 0.313. *alpha*-Endosulfan in mixture II of mix B at 20°C for short-term stability

***alpha*-endosulfan in mixture II**		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	1.84	0
25.08.2023	2.07	2
27.08.2023	2.03	4
29.08.2023	1.90	6
$\bar{Y}$	1.96	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
8	0	64.00	0
$\bar{Y}$	**b_1**	**$\bar{X}$**	**b_0**
1.96	0	1	1.96

Yi	**b_0**	**b_1**	**X_i**	**$b_1 * X_i$**	**$(Y_i - b_0 - b_1 * X_i)^2$**
1.84	1.96	0	0	0	1.55×10^{-2}
2.07	1.96	0	2	0	1.28×10^{-2}
2.03	1.96	0	4	0	4.86×10^{-3}
1.90	1.96	0	6	0	3.37×10^{-3}
				Σ	3.65×10^{-2}
				s	1.35×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	**$s(b_1)$**
8	64	8	2.55×10^{-1}	3.19×10^{-2}

$u_{sts} = t * s(b_1)$	1.92×10^{-1}
%	19.15
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.37×10^{-1}
|b1|	7.80×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.314. *beta*-Endosulfan in mixture II of mix B at 20°C for short-term stability

***beta*-endosulfan in mixture II**		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.11	0
24.08.2023	2.11	1
27.08.2023	2.10	4
29.08.2023	2.03	6
$\bar{Y}$	2.09	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
7	-1.33×10^{-15}	49.00	-1.90×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.09	-1.90×10^{-16}	1	2.09

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.11	2.09	-1.90×10^{-16}	0	0	4.40×10^{-4}
2.11	2.09	-1.90×10^{-16}	1	-1.90×10^{-16}	4.27×10^{-4}
2.10	2.09	-1.90×10^{-16}	4	-7.61×10^{-16}	2.51×10^{-4}
2.03	2.09	-1.90×10^{-16}	6	-1.14×10^{-15}	3.30×10^{-3}
				Σ	4.42×10^{-3}
				s	4.70×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
7	49	7	4.70×10^{-2}	6.72×10^{-3}

$u_{sts}=t*s(b_1)$	4.03×10^{-2}
%	4.03
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	2.89×10^{-2}
|b1|	1.15×10^{-2}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.315. Heptachlor in mixture II of mix B at 20°C for short-term stability

heptachlor in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.19	0
24.08.2023	2.20	1
27.08.2023	2.17	4
29.08.2023	2.15	6
$\bar{Y}$	2.18	
$\bar{X}$		7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
7	4.44×10^{-16}	49	6.34×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.18	6.34×10^{-17}	1	2.18

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.19	2.18	6.34×10^{-17}	0	0	2.83×10^{-4}
2.20	2.18	6.34×10^{-17}	1	6.34×10^{-17}	4.72×10^{-4}
2.17	2.18	6.34×10^{-17}	4	2.54×10^{-16}	7.09×10^{-5}
2.15	2.18	6.34×10^{-17}	6	3.81×10^{-16}	9.08×10^{-4}
				Σ	1.73×10^{-3}
				s	2.94×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
7	49	7	2.94×10^{-2}	4.21×10^{-3}

$u_{sts} = t * s(b_1)$	2.52×10^{-2}
%	2.52
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.81×10^{-2}
|b1|	8.50×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.316. Heptachlor-*endo*-epoxide in mixture II of mix B at 20°C for short-term stability

heptachlor-*endo*-epoxide in mixture II		
Date	**Concentration (2 ppm)**	**Day**
24.08.2023	1.84	1
25.08.2023	2.00	2
27.08.2023	2.05	4
29.08.2023	1.96	6
$\bar{Y}$	1.96	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
9	-6.66×10^{-16}	81.00	-7.4×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.96	-7.40×10^{-17}	1	1.96

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.84	1.96	-7.4×10^{-17}	1	-7.4×10^{-17}	1.47×10^{-2}
2.00	1.96	-7.4×10^{-17}	2	-1.5×10^{-16}	1.25×10^{-3}
2.05	1.96	-7.4×10^{-17}	4	-3.0×10^{-16}	7.57×10^{-3}
1.96	1.96	-7.4×10^{-17}	6	-4.4×10^{-16}	9.12×10^{-7}
				Σ	2.35×10^{-2}
				s	1.08×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
9	81	9	1.08×10^{-1}	1.21×10^{-2}

$u_{sts}=t*s(b_1)$	7.23×10^{-2}
%	7.23
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	5.18×10^{-2}
|b1|	1.98×10^{-2}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.317. HCB in mixture I of mix A at +4°C for short-term stability

HCB in mixture I		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.17	0
24.08.2023	1.97	1
25.08.2023	2.09	2
27.08.2023	2.09	4
`Y	2.08	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	**$\Sigma Y_i - \bar{Y}$**	**$(\Sigma X_i - \bar{X})^2$**	**b_1**
3	-4.44×10^{-16}	9.00	-1.48×10^{-16}
$\bar{Y}$	**b_1**	**$\bar{X}$**	**b_0**
2.08	-1.48×10^{-16}	1	2.08

Yi	**b_0**	**b_1**	**X_i**	**$b_1 * X_i$**	**$(Y_i - b_0 - b_1 * X_i)^2$**
2.17	2.08	-1.48×10^{-16}	0	0	8.33×10^{-3}
1.97	2.08	-1.48×10^{-16}	1	-1.48×10^{-16}	1.15×10^{-2}
2.09	2.08	-1.48×10^{-16}	2	-2.96×10^{-16}	3.63×10^{-5}
2.09	2.08	-1.48×10^{-16}	4	-5.92×10^{-16}	9.84×10^{-5}
				Σ	2.00×10^{-2}
				s	9.99×10^{-2}

$\Sigma X_i - \bar{X}$	**$(\Sigma X_i - \bar{X})^2$**	**$\sqrt{((\Sigma X_i - \bar{X})^2)}$**	**s**	**$s(b_1)$**
3	9	3	9.99×10^{-2}	3.33×10^{-2}

$u_{sts} = t * s(b_1)$	1.33×10^{-1}
%	13.3
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	0.1432
|b1|	6.30×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.318. Metolachlor in mixture I of mix A at +4°C for short-term stability

metolachlor in mixture I		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.47	0
24.08.2023	2.54	1
25.08.2023	2.53	2
29.08.2023	2.56	6
$\bar{Y}$	2.52	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
5	-2.49×10^{-1}	25	-4.99×10^{-2}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.52	-4.99×10^{-2}	1	2.57

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.47	2.57	-4.99×10^{-2}	0	0	1.09×10^{-2}
2.54	2.57	-4.99×10^{-2}	1	-4.99×10^{-2}	4.14×10^{-4}
2.53	2.57	-4.99×10^{-2}	2	-9.98×10^{-2}	2.78×10^{-3}
2.56	2.57	-4.99×10^{-2}	6	-2.99×10^{-1}	7.88×10^{-2}
				Σ	9.29×10^{-2}
				s	2.16×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
3	9	3	1.86×10^{-1}	6.22×10^{-2}

$u_{sts}=t*s(b_1)$	3.73×10^{-1}
%	37.29
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	2.67×10^{-1}
|b1|	1.03×10^{-2}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.319. *alpha*-HCH in mixture II of mix A at +4°C for short-term stability

***alpha*-HCH in mixture II**				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
23.10.2023	1.96	23.10.2023	2.09	0
24.10.2023	2.06	24.10.2023	2.02	1
25.10.2023	1.97	25.10.2023	2.09	2
15.11.2023	1.76	15.11.2023	2.06	18
$\bar{Y}$	1.94		2.06	
$\bar{X}$				1

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	2.22×10^{-16}	289	1.31×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.94	1.31×10^{-17}	1	1.94

Yi	**b_0**	**b_1**	**X_i**	**$b_1 * X_i$**	**$(Y_i - b_0 - b_1 * X_i)^2$**
1.96	1.94	1.31×10^{-17}	0	0	6.77×10^{-4}
2.06	1.94	1.31×10^{-17}	1	1.31×10^{-17}	1.49×10^{-2}
1.97	1.94	1.31×10^{-17}	2	2.61×10^{-17}	1.13×10^{-3}
1.76	1.94	1.31×10^{-17}	18	2.35×10^{-16}	3.30×10^{-2}
				Σ	4.98×10^{-2}
				s	1.29×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	**$s(b_1)$**
17	289	17	1.29×10^{-1}	7.58×10^{-3}

$u_{sts} = t * s(b_1)$	1.36×10^{-1}
%	13.64
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	3.26×10^{-2}
|b1|	1.40×10^{-2}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.319 (continued). *alpha*-HCH in mixture II of mix A at +4°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	-4.44×10^{-16}	289	-2.61×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.06	-2.61×10^{-17}	1	2.06

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.09	2.06	-2.61×10^{-17}	0	0	6.89×10^{-4}
2.02	2.06	-2.61×10^{-17}	1	-2.61×10^{-17}	1.98×10^{-3}
2.09	2.06	-2.61×10^{-17}	2	-5.22×10^{-17}	6.92×10^{-4}
2.06	2.06	-2.61×10^{-17}	18	-4.70×10^{-16}	6.49×10^{-5}
				Σ	3.42×10^{-3}
				s	3.38×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	3.38×10^{-2}	1.99×10^{-3}

$u_{sts} = t * s(b_1)$	3.58×10^{-2}
%	3.58
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	8.55×10^{-3}
|b1|	6.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.320. *gamma*-HCH in mixture II of mix A at +4°C for short-term stability

***gamma*-HCH in mixture II**				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
23.10.2023	1.79	23.10.2023	2.03	0
24.10.2023	1.91	24.10.2023	2.03	1
25.10.2023	1.84	25.10.2023	1.90	2
15.11.2023	1.96	15.11.2023	2.07	18
$\bar{Y}$	1.87		2.01	
$\bar{X}$				1

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	-4.44×10^{-16}	289	-2.61×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.87	-2.61×10^{-17}	1	1.87

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.79	1.87	-2.61×10^{-17}	0	0	7.40×10^{-3}
1.91	1.87	-2.61×10^{-17}	1	-2.61×10^{-17}	1.35×10^{-3}
1.84	1.87	-2.61×10^{-17}	2	-5.22×10^{-17}	1.31×10^{-3}
1.96	1.87	-2.61×10^{-17}	18	-4.70×10^{-16}	7.30×10^{-3}
				Σ	1.74×10^{-2}
				s	7.61×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	$s(b_1)$
17	289	17	7.61×10^{-2}	4.47×10^{-3}

$u_{sts} = t * s(b_1)$	8.05×10^{-2}
%	8.05
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.92×10^{-2}
|b1|	6.90×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.320 (continued). *gamma*-HCH in mixture II of mix A at +4°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	-6.66×10^{-16}	289	-3.92×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.01	-3.92×10^{-17}	1	2.01

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.03	2.01	-3.92×10^{-17}	0	0	4.73×10^{-4}
2.03	2.01	-3.92×10^{-17}	1	-3.92×10^{-17}	3.54×10^{-4}
1.90	2.01	-3.92×10^{-17}	2	-7.84×10^{-17}	1.16×10^{-2}
2.07	2.01	-3.92×10^{-17}	18	-7.05×10^{-16}	4.52×10^{-3}
				Σ	1.70×10^{-2}
				s	7.52x10-^{2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	7.52×10^{-2}	4.42×10^{-3}

$u_{sts}=t*s(b_1)$	7.96×10^{-2}
%	7.96
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.90×10^{-2}
|b1|	4.60×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.321. Aldrin in mixture II of mix A at +4°C for short-term stability

aldrin in mixture II				
First Bottle		Second Bottle		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
23.10.2023	1.81	23.10.2023	2.05	0
24.10.2023	1.99	24.10.2023	1.99	1
25.10.2023	1.82	25.10.2023	1.91	2
15.11.2023	2.04	15.11.2023	2.08	18
$\bar{Y}$	1.92		2.01	
$\bar{X}$				1

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	-6.66×10^{-16}	289	-3.92×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.92	-3.92×10^{-17}	1	1.92

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.81	1.92	-3.92×10^{-17}	0	0	1.09×10^{-2}
1.99	1.92	-3.92×10^{-17}	1	-3.9×10^{-17}	5.11×10^{-3}
1.82	1.92	-3.92×10^{-17}	2	-7.8×10^{-17}	8.58×10^{-3}
2.04	1.92	-3.92×10^{-17}	18	-7.1×10^{-16}	1.57×10^{-2}
				Σ	4.03×10^{-2}
				s	1.16×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	1.16×10^{-1}	6.82×10^{-3}

$u_{sts}=t*s(b_1)$	1.23×10^{-1}
%	12.27
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	2.93×10^{-2}
|b1|	9.80×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.321 (continued). Aldrin in mixture II of mix A at +4°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	1.11×10^{-15}	289	6.53×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.01	6.53×10^{-17}	1	2.01

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.05	2.01	6.53×10^{-17}	0	0	0.00
1.99	2.01	6.53×10^{-17}	1	6.53×10^{-17}	3.08×10^{-4}
1.91	2.01	6.53×10^{-17}	2	1.31×10^{-16}	9.31×10^{-3}
2.08	2.01	6.53×10^{-17}	18	1.18×10^{-15}	4.92×10^{-3}
				Σ	1.65×10^{-2}
				s	7.41×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	7.41×10^{-2}	4.36×10^{-3}

$u_{sts}=t*s(b_1)$	7.85×10^{-2}
%	7.85
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.87×10^{-2}
|b1|	4.80×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.322. Dieldrin in mixture II of mix A at +4°C for short-term stability

dieldrin in mixture II					
First Bottle			**Second Bottle**		
Date	**Concentration (2 ppm)**	**Day**	**Date**	**Concentration (2 ppm)**	**Day**
23.10.2023	2.02	0	23.10.2023	1.93	0
24.10.2023	2.06	1	24.10.2023	2.09	1
25.10.2023	2.06	2	25.10.2023	1.76	2
15.11.2023	2.07	18	27.10.2023	2.06	4
$\bar{Y}$	2.05			2.01	
$\bar{X}$		1			1

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	0	289	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.05	0	1	2.05

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.02	2.05	0	0	0	1.15×10^{-3}
2.06	2.05	0	1	0	6.10×10^{-5}
2.06	2.05	0	2	0	3.63×10^{-5}
2.07	2.05	0	18	0	4.04×10^{-4}
			Σ		1.65×10^{-3}
			s		2.35×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	2.35×10^{-2}	1.38×10^{-3}

$u_{sts}=t*s(b_1)$	2.49×10^{-2}
%	2.49
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	5.94×10^{-3}
|b1|	1.70×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.322 (continued). Dieldrin in mixture II of mix A at +4°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
3	-6.66×10^{-16}	9	-2.22×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.01	-2.22×10^{-16}	1	2.01

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.99	2.01	-2.22×10^{-16}	0	0	6.18×10^{-4}
2.03	2.01	-2.22×10^{-16}	1	-2.22×10^{-16}	2.15×10^{-4}
2.08	2.01	-2.22×10^{-16}	2	-4.44×10^{-16}	4.23×10^{-3}
1.96	2.01	-2.22×10^{-16}	4	-8.88×10^{-16}	3.01×10^{-3}
				Σ	6.99×10^{-2}
				s	1.87×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
3	9	3	5.19×10^{-2}	1.73×10^{-2}

$u_{sts}=t*s(b_1)$	6.92×10^{-2}
%	6.92
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	7.44×10^{-2}
|b1|	8.50×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.323. Endrin in mixture II of mix A at +4°C for short-term stability

endrin in mixture II					
First Bottle			**Second Bottle**		
Date	**Concentration (2 ppm)**	**Day**	**Date**	**Concentration (2 ppm)**	**Day**
23.10.2023	2.01	0	23.10.2023	2.22	0
24.10.2023	2.03	1	24.10.2023	1.82	1
25.10.2023	2.00	2	25.10.2023	2.00	3
15.11.2023	2.05	18	29.10.2023	2.08	5
$\bar{Y}$	2.03			2.03	
$\bar{X}$		1			1

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	$1.33x10^{-15}$	289	$7.84x10^{-17}$
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.03	$7.84x10^{-17}$	1	2.03

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i-b_0-b_1*X_i)^2$
2.01	2.03	$7.84x10^{-17}$	0	0	$2.47x10^{-4}$
2.03	2.03	$7.84x10^{-17}$	1	$7.84x10^{-17}$	$6.91x10^{-5}$
2.00	2.03	$7.84x10^{-17}$	2	$1.57x10^{-16}$	$4.68x10^{-4}$
2.05	2.03	$7.84x10^{-17}$	18	$1.41x10^{-15}$	$8.44x10^{-4}$
			Σ		$1.63x10^{-3}$
			s		$2.85x10^{-2}$

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	$2.85x10^{-2}$	$1.68x10^{-3}$

$u_{sts}=t*s(b_1)$	$1.46x10^{-1}$
%	$3.02x10^{-2}$
tcrit. n-2 at 95 CL	3.02
tcrit. * $s(b_1)$	4.3
|b1|	$7.22x10^{-3}$
|b1| < tcrit.*$s(b_1)$	stable

Table 0.323 (continued). Endrin in mixture II of mix A at +4°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
4	-2.22×10^{-16}	16	-5.55×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.03	-5.55×10^{-17}	1	2.03

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.22	2.03	-5.55×10^{-17}	0	0	3.73×10^{-2}
1.82	2.03	-5.55×10^{-17}	1	-5.55×10^{-17}	4.53×10^{-2}
2.00	2.03	-5.55×10^{-17}	2	-1.11×10^{-16}	1.06×10^{-3}
2.08	2.03	-5.55×10^{-17}	5	-2.78×10^{-16}	2.75×10^{-3}
				Σ	8.64×10^{-2}
				s	2.08×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
4	16	4	2.08×10^{-1}	5.20×10^{-2}

$u_{sts} = t * s(b_1)$	2.60×10^{-1}
%	25.98
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	2.23×10^{-1}
$\|b1\|$	1.10×10^{-3}
$\|b1\| < tcrit. * s(b_1)$	stable

Table 0.324. 4,4'-DDD in mixture II of mix A at +4°C for short-term stability

4,4'-DDD in mixture II					
First Bottle			Second Bottle		
Date	**Concentration (2 ppm)**	**Day**	**Date**	**Concentration (2 ppm)**	**Day**
23.10.2023	2.11	0	23.10.2023	2.06	0
24.10.2023	2.10	1	24.10.2023	2.19	1
25.10.2023	2.10	2	25.10.2023	1.90	2
15.11.2023	2.04	18	27.10.2023	2.17	4
$\bar{Y}$	2.09			2.08	
$\bar{X}$		1			1

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	0	289	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.09	0	1	2.09

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.11	2.09	0	0	0	3.31×10^{-4}
2.10	2.09	0	1	0	2.19×10^{-4}
2.10	2.09	0	2	0	1.94×10^{-4}
2.04	2.09	0	18	0	2.20×10^{-3}
			Σ		2.94×10^{-3}
			s		3.13×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	3.13×10^{-2}	1.84×10^{-3}

$u_{sts} = t * s(b_1)$	3.32×10^{-2}
%	3.32
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	7.92×10^{-3}
|b1|	3.70×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.324 (continued). 4,4'-DDD in mixture II of mix A at +4°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
3	0	9	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.08	0	1	2.08

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.06	2.08	0	0	0	2.22×10^{-4}
2.19	2.08	0	1	0	1.15×10^{-2}
1.90	2.08	0	2	0	3.33×10^{-2}
2.17	2.08	0	4	0	8.10×10^{-3}
				Σ	5.32×10^{-2}
				s	1.33×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
3	9	3	1.33×10^{-1}	4.44×10^{-2}

$u_{sts} = t * s(b_1)$	1.78×10^{-1}
%	17.75
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.91×10^{-1}
$\|b1\|$	1.17×10^{-2}
$\|b1\| < tcrit. * s(b_1)$	stable

Table 0.325. 4,4’-DDT in mixture II of mix A at +4°C for short-term stability

4,4’-DDT in mixture II					
First Bottle			Second Bottle		
Date	**Concentration (2 ppm)**	**Day**	**Date**	**Concentration (2 ppm)**	**Day**
23.10.2023	2.79	0	23.10.2023	2.35	0
24.10.2023	2.78	1	24.10.2023	2.42	1
25.10.2023	2.82	2	27.10.2023	2.28	2
15.11.2023	2.93	18	29.10.2023	2.40	6
$\bar{Y}$	2.38			2.36	
$\bar{X}$		1			1

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	1.80	289	$1.06x10^{-1}$
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.38	$1.06x10^{-1}$	1	2.28

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i-b_0-b_1*X_i)^2$
2.79	2.28	$1.06x10^{-1}$	0	0	$2.66x10^{-1}$
2.78	2.28	$1.06x10^{-1}$	1	1.06x10-1	$1.60x10^{-1}$
2.82	2.28	$1.06x10^{-1}$	2	2.12x10-1	$1.09x10^{-1}$
2.93	2.28	$1.06x10^{-1}$	18	1.90	1.55
			Σ		2.09
			s		$8.34x10^{-1}$

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	$8.34x10^{-1}$	$4.91x10^{-2}$

$u_{sts}=t*s(b_1)$	$8.83x10^{-1}$
%	88.34
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	$2.11x10^{-1}$
|b1|	$8.10x10^{-3}$
|b1| < tcrit.*$s(b_1)$	stable

Table 0.325 (continued). 4,4'-DDT in mixture II of mix A at +4°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
7	-8.88×10^{-16}	49	-1.27×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.36	-1.27×10^{-16}	1	2.36

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.35	2.36	-1.27×10^{-16}	0	0	2.72×10^{-4}
2.42	2.36	-1.27×10^{-16}	1	-1.27x10-16	3.43×10^{-3}
2.28	2.36	-1.27×10^{-16}	4	-5.08x10-16	6.80×10^{-3}
2.40	2.36	-1.27×10^{-16}	6	-7.61x10-16	1.63×10^{-3}
				Σ	5.32×10^{-2}
				s	1.33×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
7	49	7	6.36×10^{-2}	9.09×10^{-3}

$u_{sts} = t * s(b_1)$	5.45×10^{-2}
%	5.45
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	3.91×10^{-2}
$\|b1\|$	1.30×10^{-3}
$\|b1\| < tcrit. * s(b_1)$	stable

Table 0.326. 2,4'-DDT in mixture II of mix A at +4°C for short-term stability

2,4'-DDT in mixture II					
First Bottle			Second Bottle		
Date	**Concentration (2 ppm)**	**Day**	**Date**	**Concentration (2 ppm)**	**Day**
23.10.2023	1.97	0	23.10.2023	2.13	0
24.10.2023	1.99	1	24.10.2023	2.26	1
25.10.2023	1.97	2	27.10.2023	2.26	4
15.11.2023	2.03	18	29.10.2023	2.23	6
$\bar{Y}$	1.99			2.22	
$\bar{X}$		1			1

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	-4.44×10^{-16}	289	-2.61×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.99	-2.61×10^{-17}	1	1.99

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.97	1.99	-2.61×10^{-17}	0	0	2.74×10^{-4}
1.99	1.99	-2.61×10^{-17}	1	-2.61×10^{-17}	2.24×10^{-6}
1.97	1.99	-2.61×10^{-17}	2	-5.22×10^{-17}	6.07×10^{-4}
2.03	1.99	-2.61×10^{-17}	18	-4.70×10^{-16}	1.58×10^{-3}
			Σ		2.46×10^{-3}
			s		3.51×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	3.51×10^{-2}	2.06×10^{-3}

$u_{sts}=t*s(b_1)$	3.71×10^{-2}
%	3.71
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	8.87×10^{-3}
$\|b1\|$	3.00×10^{-3}
$\|b1\| <$ tcrit.*$s(b_1)$	stable

Table 0.326 (continued). 2,4'-DDT in mixture II of mix A at +4°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
7	-1.33×10^{-15}	49	-1.90×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.22	-1.90x10-16	1	2.22

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.13	2.22	-1.90×10^{-16}	0	0	8.36×10^{-3}
2.26	2.22	-1.90×10^{-16}	1	-1.90×10^{-16}	1.85×10^{-3}
2.26	2.22	-1.90×10^{-16}	4	-7.61×10^{-16}	1.48×10^{-3}
2.23	2.22	-1.90×10^{-16}	6	-1.14×10^{-15}	9.79×10^{-5}
				Σ	1.18×10^{-2}
				s	7.68×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
7	49	7	7.68×10^{-2}	1.10×10^{-2}

$u_{sts} = t * s(b_1)$	6.58×10^{-2}
%	6.58
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	4.72×10^{-2}
|b1|	1.13×10^{-2}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.327. *alpha*-Endosulfan in mixture II of mix A at +4°C for short-term stability

***alpha*-endosulfan in mixture II**				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
23.10.2023	2.01	23.10.2023	2.06	0
24.10.2023	2.03	24.10.2023	2.06	1
25.10.2023	2.07	25.10.2023	1.99	2
15.11.2023	2.07	15.11.2023	2.06	18
$\bar{Y}$	2.05		2.04	
$\bar{X}$				1

First Bottle			
$\Sigma X_i - \bar{X}$	**$\Sigma Y_i - \bar{Y}$**	**$(\Sigma X_i - \bar{X})^2$**	**b_1**
17	-8.88×10^{-16}	289	-5.22×10^{-17}
$\bar{Y}$	**b_1**	**$\bar{X}$**	**b_0**
2.05	-5.22x10-17	1	2.05

Yi	**b_0**	**b_1**	**X_i**	**$b_1 * X_i$**	**$(Y_i - b_0 - b_1 * X_i)^2$**
2.01	2.05	-5.22×10^{-17}	0	0	1.51×10^{-3}
2.03	2.05	-5.22×10^{-17}	1	-5.22×10^{-17}	2.17×10^{-4}
2.07	2.05	-5.22×10^{-17}	2	-1.04×10^{-16}	7.29×10^{-4}
2.07	2.05	-5.22×10^{-17}	18	-9.40×10^{-16}	7.05×10^{-4}
				Σ	3.16×10^{-3}
				s	3.97×10^{-2}

$\Sigma X_i - \bar{X}$	**$(\Sigma X_i - \bar{X})^2$**	**$\sqrt{((\Sigma X_i - \bar{X})^2)}$**	**s**	**$s(b_1)$**
17	289	17	3.97×10^{-2}	2.34×10^{-3}

$u_{sts}=t*s(b_1)$	4.21×10^{-2}
%	4.21
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.01×10^{-2}
|b1|	2.40×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.327 (continued). *alpha*-Endosulfan in mixture II of mix A at +4°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	-8.88×10^{-16}	289	-5.22×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.04	-5.22×10^{-17}	1	2.04

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.06	2.04	-5.22×10^{-17}	0	0	3.68×10^{-4}
2.06	2.04	-5.22×10^{-17}	1	-5.22×10^{-17}	3.68×10^{-4}
1.99	2.04	-5.22×10^{-17}	2	-1.04×10^{-16}	2.93×10^{-3}
2.06	2.04	-5.22×10^{-17}	18	-9.40×10^{-16}	2.49×10^{-4}
				Σ	3.92×10^{-3}
				s	4.43×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	4.43×10^{-2}	2.60×10^{-3}

$u_{sts} = t * s(b_1)$	4.69×10^{-2}
%	4.69
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.12×10^{-2}
$\|b1\|$	9.00×10^{-4}
$\|b1\| <$ tcrit.*$s(b_1)$	stable

Table 0.328. *beta*-Endosulfan in mixture II of mix A at +4°C for short-term stability

***beta*-endosulfan in mixture II**					
First Bottle			**Second Bottle**		
Date	**Concentration (2 ppm)**	**Day**	**Date**	**Concentration (2 ppm)**	**Day**
23.10.2023	2.03	0	23.10.2023	1.91	0
24.10.2023	2.01	1	24.10.2023	1.94	1
25.10.2023	2.03	2	25.10.2023	1.98	2
15.11.2023	2.06	18	27.10.2023	1.95	4
$\bar{Y}$	2.03			1.95	
$\bar{X}$		1			1

First Bottle						
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1			
14	4.44×10^{-16}	289	2.61×10^{-17}			
$\bar{Y}$	b_1	$\bar{X}$	b_0			
2.03	2.61×10^{-17}	1	2.03			
Yi		**b_0**	**b_1**	**X_i**	**$b_1 * X_i$**	**$(Y_i - b_0 - b_1 * X_i)^2$**
2.03		2.03	2.61×10^{-17}	0	0	1.02×10^{-6}
2.01		2.03	2.61×10^{-17}	1	2.61×10^{-17}	4.30×10^{-4}
2.03		2.03	2.61×10^{-17}	2	5.22×10^{-17}	3.68×10^{-5}
2.06		2.03	2.61×10^{-17}	18	4.70×10^{-16}	7.73×10^{-4}
					Σ	1.24×10^{-3}
					s	2.03×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	**$s(b_1)$**
14	196	17	289	17

$u_{sts} = t * s(b_1)$	2.15×10^{-2}
%	2.15
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	5.14×10^{-3}
|b1|	2.10×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.328 (continued). *beta*-Endosulfan in mixture II of mix A at +4°C for short-term stability

Second Bottle						
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1			
3	0	9	0			
$\bar{Y}$	b_1	$\bar{X}$	b_0			
1.95	0	1	1.95			
Yi		b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.91		1.95	0	0	0	1.11×10^{-3}
1.94		1.95	0	1	0	9.05×10^{-5}
1.98		1.95	0	2	0	1.28×10^{-3}
1.95		1.95	0	4	0	5.01×10^{-5}
					Σ	2.53×10^{-3}
					s	2.90×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
3	9	3	2.90×10^{-2}	9.68×10^{-3}

$u_{sts} = t * s(b_1)$	3.87×10^{-2}
%	3.87
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	4.16×10^{-2}
$\|b1\|$	1.03×10^{-2}
$\|b1\| < tcrit. * s(b_1)$	stable

Table 0.329. Heptachlor in mixture II of mix A at +4°C for short-term stability

heptachlor in mixture II				
First Bottle		Second Bottle		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
23.10.2023	2.08	23.10.2023	2.09	0
24.10.2023	2.09	24.10.2023	2.11	1
27.10.2023	2.06	27.10.2023	2.08	4
29.10.2023	2.09	29.10.2023	2.10	6
$\bar{Y}$	2.08		2.10	
$\bar{X}$				1

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
7	-8.88×10^{-16}	49	-1.27×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.08	-1.27×10^{-16}	1	2.08

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.08	2.08	-1.27×10^{-16}	0	0	1.13×10^{-6}
2.09	2.08	-1.27×10^{-16}	1	-1.27×10^{-16}	1.25×10^{-4}
2.06	2.08	-1.27×10^{-16}	4	-5.081×10^{-16}	3.64×10^{-4}
2.09	2.08	-1.27×10^{-16}	6	-7.61×10^{-16}	4.68×10^{-5}
				Σ	5.37×10^{-4}
				s	1.34×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
7	49	7	1.34×10^{-2}	1.91×10^{-3}

$u_{sts}=t*s(b_1)$	1.15×10^{-2}
%	1.15
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	8.22×10^{-3}
|b1|	1.10×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.329 (continued). Heptachlor in mixture II of mix A at +4°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
7	0	49	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.10	0	1	2.10

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.09	2.10	0	0	0	6.23×10^{-5}
2.11	2.10	0	1	0	3.21×10^{-4}
2.08	2.10	0	4	0	2.89×10^{-4}
2.10	2.10	0	6	0	4.87×10^{-5}
				Σ	7.21×10^{-4}
				s	1.55×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
7	49	7	1.55×10^{-2}	2.21×10^{-3}

$u_{sts}=t*s(b_1)$	1.33×10^{-2}
%	1.33
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	9.52×10^{-3}
|b1|	4.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.330. Heptachlor-*endo*-epoxide in mixture II of mix A at -20°C for short-term stability

heptachlor-*endo*-epoxide in mixture II					
First Bottle			**Second Bottle**		
Date	**Concentration (2 ppm)**	**Day**	**Date**	**Concentration (2 ppm)**	**Day**
23.10.2023	2.03	0	23.10.2023	2.03	0
24.10.2023	2.01	1	24.10.2023	2.03	1
25.10.2023	2.00	2	25.10.2023	2.05	2
15.11.2023	2.01	18	15.11.2023	2.40	18
$\bar{Y}$	2.01			2.13	
$\bar{X}$		1			1

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	-8.88×10^{-16}	289	-5.22×10^{-17}

$\bar{Y}$	b_1	$\bar{X}$	b_0
2.01	-5.22×10^{-17}	1	2.01

Y_i	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.03	2.01	-5.22×10^{-17}	0	0	2.52×10^{-4}
2.01	2.01	-5.22×10^{-17}	1	-5.22×10^{-17}	1.60×10^{-5}
2.00	2.01	-5.22×10^{-17}	2	-1.04×10^{-16}	1.05×10^{-4}
2.01	2.01	-5.22×10^{-17}	18	-9.40×10^{-16}	2.68×10^{-6}
				Σ	3.76×10^{-4}
				s	1.37×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	1.37×10^{-2}	8.06×10^{-4}

$u_{sts} = t * s(b_1)$	1.45×10^{-2}
%	1.45
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	3.47×10^{-3}
|b1|	2.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.330 (continued). Heptachlor-*endo*-epoxide in mixture II of mix A at -20°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
3	-4.44×10^{-16}	9	-1.48×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.13	-1.48×10^{-16}	1	2.13

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.03	2.13	-1.48×10^{-16}	0	0	1.08×10^{-2}
2.03	2.13	-1.48×10^{-16}	1	-1.48×10^{-16}	1.09×10^{-2}
2.05	2.13	-1.48×10^{-16}	2	-2.96×10^{-16}	6.19×10^{-3}
2.40	2.13	-1.48×10^{-16}	18	-2.66×10^{-15}	7.42×10^{-2}
				Σ	1.02×10^{-1}
				s	2.26×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
3	9	3	2.26×10^{-1}	7.53×10^{-2}

usts=t*s(b1)	4.52×10^{-1}
%	45.19
tcrit, n-2 at 95 CL	4.3
tcrit. * s(b1)	3.24×10^{-1}
|b1|	5.80×10^{-3}
|b1| < tcrit.*s(b1)	stable

Table 0.331. HCB in mixture I of mix B at +4°C for short-term stability

HCB in mixture I		
Date	**Concentration (2 ppm)**	**Day**
23.10.2023	1.81	0
24.10.2023	1.58	1
25.10.2023	1.44	2
15.11.2023	1.73	18
$\bar{Y}$	1.64	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	-2.22×10^{-16}	289	-1.31×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.64	-1.31×10^{-17}	1	1.64

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.81	1.64	-1.31×10^{-17}	0	0	2.85×10^{-2}
1.58	1.64	-1.31×10^{-17}	1	-1.31×10^{-17}	3.67×10^{-3}
1.44	1.64	-1.31×10^{-17}	2	-2.61×10^{-17}	3.93×10^{-2}
1.73	1.64	-1.31×10^{-17}	18	-2.35×10^{-16}	8.10×10^{-3}
				Σ	7.96×10^{-2}
				s	1.99×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	1.99×10^{-1}	1.17×10^{-2}

$u_{sts} = t * s(b_1)$	2.11×10^{-1}
%	21.12
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	5.04×10^{-2}
|b1|	5.30×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.332. Metolachlor in mixture I of mix B at +4°C for short-term stability

metolachlor in mixture I		
Date	**Concentration (2 ppm)**	**Day**
23.10.2023	2.08	0
25.10.2023	2.01	2
27.10.2023	1.83	4
29.10.2023	2.09	6
$\bar{Y}$	2.00	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
8	-2.22×10^{-16}	64	-2.78×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.00	-2.78×10^{-17}	1	2.00

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.08	2.00	-2.78×10^{-17}	0	0	5.74×10^{-3}
2.01	2.00	-2.78×10^{-17}	2	-5.55×10^{-17}	2.42×10^{-5}
1.83	2.00	-2.78×10^{-17}	4	-1.11×10^{-16}	2.86×10^{-2}
2.09	2.00	-2.78×10^{-17}	6	-1.67×10^{-16}	7.80×10^{-3}
				Σ	4.21×10^{-2}
				s	1.45x10-1

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
8	64	8	1.45×10^{-1}	1.81×10^{-2}

$u_{sts} = t * s(b_1)$	1.09×10^{-1}
%	10.88
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	7.80×10^{-2}
|b1|	6.80×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.333. *alpha*-HCH in mixture II of mix B at +4°C for short-term stability

***alpha*-HCH in mixture II**		
Date	**Concentration (2 ppm)**	**Day**
23.08.2023	2.08	0
24.08.2023	2.04	1
25.08.2023	2.00	2
27.08.2023	2.00	4
$\bar{Y}$	2.03	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
3	1.33×10^{-15}	9.00	4.44×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.03	4.44×10^{-16}	1	2.03

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.08	2.03	4.44×10^{-16}	0	0	2.28×10^{-3}
2.04	2.03	4.44×10^{-16}	1	4.44×10^{-16}	1.07×10^{-4}
2.00	2.03	4.44×10^{-16}	2	8.88×10^{-16}	6.03×10^{-4}
2.00	2.03	4.44×10^{-16}	4	1.78×10^{-15}	1.13×10^{-3}
				Σ	4.12×10^{-3}
				s	4.54×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
3	9	3	4.54×10^{-2}	1.51×10^{-2}

$u_{sts}=t*s(b_1)$	6.05×10^{-2}
%	6.05
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	6.51×10^{-2}
|b1|	1.98×10^{-2}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.334. *gamma*-HCH in mixture II of mix B at +4°C for short-term stability

***gamma*-HCH in mixture II**		
Date	**Concentration (2 ppm)**	**Day**
23.10.2023	1.88	0
24.10.2023	1.99	1
27.10.2023	2.01	4
29.10.2023	1.98	6
$\bar{Y}$	1.97	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
7	-2.22x10-16	49.00	-3.17x10-17
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.97	$-3.17x10^{-17}$	1	1.97

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i-b_0-b_1*X_i)^2$
1.88	1.97	$-3.17x10^{-17}$	0	0	$7.26x10^{-3}$
1.99	1.97	$-3.17x10^{-17}$	1	$-3.17x10^{-17}$	$7.54x10^{-4}$
2.01	1.97	$-3.17x10^{-17}$	4	$-1.26x10^{-16}$	$1.73x10^{-3}$
1.98	1.97	$-3.17x10^{-17}$	6	$-1.90x10^{-16}$	$2.62x10^{-4}$
				Σ	$1.00x10^{-2}$
				s	$7.07x10^{-2}$

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
7	49	7	$7.07x10^{-2}$	$1.01x10^{-2}$

$u_{sts}=t*s(b_1)$	$6.06x10^{-2}$
%	6.06
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	$4.34x10^{-2}$
|b1|	$1.28x10^{-2}$
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.335. Aldrin in mixture II of mix B at +4°C for short-term stability

aldrin in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.10.2023	1.98	0
24.10.2023	1.98	1
25.10.2023	1.95	2
15.11.2023	2.05	18
$\bar{Y}$	1.99	
$\bar{X}$		7

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	-4.44×10^{-16}	289	-2.61×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.99	-2.61×10^{-17}	1	1.99

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.98	1.99	-2.61×10^{-17}	0	0	1.59×10^{-4}
1.98	1.99	-2.61×10^{-17}	1	-2.61×10^{-17}	1.75×10^{-4}
1.95	1.99	-2.61×10^{-17}	2	-5.22×10^{-17}	1.29×10^{-3}
2.05	1.99	-2.61×10^{-17}	18	-4.70×10^{-16}	3.81×10^{-3}
				Σ	5.43×10^{-3}
				s	5.21×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
9	81	9	5.21×10^{-2}	5.79×10^{-3}

$u_{sts}=t*s(b_1)$	1.04×10^{-1}
%	10.42
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	2.49×10^{-2}
|b1|	4.70×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.336. Dieldrin in mixture II of mix B at +4°C for short-term stability

dieldrin in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.10.2023	2.07	0
24.10.2023	2.05	1
25.10.2023	2.05	2
15.11.2023	1.99	18

$\bar{Y}$	2.04
$\bar{X}$	1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	-6.66×10^{-16}	289.00	-3.92×10^{-17}

$\bar{Y}$	b_1	$\bar{X}$	b_0
2.04	-3.92×10^{-17}	1	2.04

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.07	2.04	-3.92×10^{-17}	0	0	7.34×10^{-4}
2.05	2.04	-3.92×10^{-17}	1	-3.92×10^{-17}	7.60×10^{-5}
2.05	2.04	-3.92×10^{-17}	2	-7.84×10^{-17}	1.68×10^{-4}
1.99	2.04	-3.92×10^{-17}	18	-7.05×10^{-16}	2.38×10^{-3}
				Σ	3.36×10^{-3}
				s	4.10×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	4.10×10^{-2}	2.41×10^{-3}

$u_{sts} = t * s(b_1)$	4.34×10^{-2}
%	4.34
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.04×10^{-2}
|b1|	3.90×10^{-3}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.337. Endrin in mixture II of mix B at +4°C for short-term stability

endrin in mixture II		
Date	**Concentration (2 ppm)**	**Day**
24.10.2023	2.04	1
25.10.2023	2.02	2
27.10.2023	2.02	4
29.10.2023	2.07	6
$\bar{Y}$	1.99	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
14	-4.44×10^{-16}	196	-3.17×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.04	4.93×10^{-17}	1	2.04

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.04	2.04	4.93×10^{-17}	1	4.93×10^{-17}	3.06×10^{-6}
2.02	2.04	4.93×10^{-17}	2	9.87×10^{-17}	4.36×10^{-4}
2.02	2.04	4.93×10^{-17}	4	1.97×10^{-16}	2.64×10^{-4}
2.07	2.04	4.93×10^{-17}	6	2.96×10^{-16}	1.25×10^{-3}
				Σ	1.95×10^{-3}
				s	3.13×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
9	81	9	3.13×10^{-2}	3.47×10^{-3}

$u_{sts} = t * s(b_1)$	2.08×10^{-2}
%	2.08
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.49×10^{-2}
|b1|	7.30×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.338. 4,4'-DDD in mixture I of mix B at +4°C for short-term stability

4,4'-DDD in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.10.2023	2.08	0
24.10.2023	2.06	1
25.10.2023	2.06	2
15.11.2023	2.11	18
$\bar{Y}$	2.08	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	-7.20×10^{-1}	289	-4.23×10^{-2}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.08	-4.23×10^{-2}	1	2.12

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.08	2.12	-4.23×10^{-2}	0	0	1.67×10^{-3}
2.06	2.12	-4.23×10^{-2}	1	-4.23×10^{-2}	2.50×10^{-4}
2.06	2.12	-4.23×10^{-2}	2	-8.47×10^{-2}	5.95×10^{-4}
2.11	2.12	-4.23×10^{-2}	18	-7.62×10^{-1}	5.66×10^{-1}
				Σ	5.68×10^{-1}
				s	5.33×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	$s(b_1)$
17	289	17	5.33×10^{-1}	3.14×10^{-2}

$u_{sts} = t * s(b_1)$	5.64×10^{-1}
%	56.43
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.35×10^{-1}
|b1|	2.40×10^{-3}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.339. 4,4’-DDT in mixture II of mix B at +4°C for short-term stability

4,4’-DDT in mixture II		
Date	**Concentration (2 ppm)**	**Day**
24.10.2023	2.39	1
25.10.2023	2.37	2
27.10.2023	2.40	4
29.10.2023	2.38	6
$\bar{Y}$	2.39	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
9	8.88×10^{-16}	81	9.87×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.39	9.87×10^{-17}	1	2.39

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.39	2.39	9.87×10^{-17}	1	9.87×10^{-17}	7.31×10^{-5}
2.37	2.39	9.87×10^{-17}	2	1.97×10^{-16}	4.00×10^{-4}
2.40	2.39	9.87×10^{-17}	4	3.95×10^{-16}	2.46×10^{-4}
2.38	2.39	9.87×10^{-17}	6	5.92×10^{-16}	1.80×10^{-5}
				Σ	7.37×10^{-4}
				s	1.92×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
9	81	9	1.92×10^{-2}	2.13×10^{-3}

$u_{sts}=t*s(b_1)$	1.28×10^{-2}
%	1.28
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	9.17×10^{-3}
|b1|	4.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.340. 2,4’-DDT in mixture II of mix B at +4°C for short-term stability

2,4’-DDT in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.10.2023	2.01	0
24.10.2023	1.99	1
25.10.2023	2.04	2
15.11.2023	2.04	18
$\bar{Y}$	2.02	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	6.66×10^{-16}	289	3.92×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.02	3.92×10^{-17}	1	2.02

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.01	2.02	3.92×10^{-17}	0	0	1.25×10^{-4}
1.99	2.02	3.92×10^{-17}	1	3.92×10^{-17}	1.05×10^{-3}
2.04	2.02	3.92×10^{-17}	2	7.84×10^{-17}	4.03×10^{-4}
2.04	2.02	3.92×10^{-17}	18	7.05×10^{-16}	5.53×10^{-4}
				Σ	2.13×10^{-3}
				s	3.26×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	3.26×10^{-2}	1.92×10^{-3}

$u_{sts}=t*s(b_1)$	3.46×10^{-2}
%	3.46
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	8.26×10^{-3}
|b1|	2.00×10^{-3}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.341. *alpha*-Endosulfan in mixture II of mix B at +4°C for short-term stability

***alpha*-endosulfan in mixture II**		
Date	**Concentration (2 ppm)**	**Day**
23.10.2023	1.99	0
24.10.2023	2.06	1
25.10.2023	1.99	2
15.11.2023	2.01	18
$\bar{Y}$	2.02	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	0	289	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.02	0	1	2.02

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.99	2.02	0	0	0	5.34×10^{-4}
2.06	2.02	0	1	0	2.21×10^{-3}
1.99	2.02	0	2	0	4.93×10^{-4}
2.01	2.02	0	18	0	2.78×10^{-6}
				Σ	3.24×10^{-3}
				s	4.02×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	4.02×10^{-2}	2.37×10^{-3}

$u_{sts}=t*s(b_1)$	4.26×10^{-2}
%	4.26
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.02×10^{-2}
|b1|	1.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.342. *beta*-Endosulfan in mixture II of mix B at +4°C for short-term stability

***beta*-endosulfan in mixture I**		
Date	**Concentration (2 ppm)**	**Day**
23.10.2023	2.04	0
24.10.2023	2.09	1
25.10.2023	2.04	2
15.11.2023	2.07	18
$\bar{Y}$	2.06	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	4.44×10^{-16}	289	2.61×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.06	2.61×10^{-17}	1	2.06

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.04	2.06	2.61×10^{-17}	0	0	4.66×10^{-4}
2.09	2.06	2.61×10^{-17}	1	2.61×10^{-17}	1.13×10^{-3}
2.04	2.06	2.61×10^{-17}	2	5.22×10^{-17}	3.91×10^{-4}
2.07	2.06	2.61×10^{-17}	18	4.70×10^{-16}	5.95×10^{-5}
				Σ	2.05×10^{-3}
				s	3.20×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
17	289	17	3.20×10^{-2}	1.88×10^{-3}

$u_{sts} = t * s(b_1)$	3.39×10^{-2}
%	3.39
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	8.10×10^{-3}
|b1|	6.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.343. Heptachlor in mixture II of mix B at +4°C for short-term stability

heptachlor in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.10.2023	2.08	0
24.10.2023	2.08	1
25.10.2023	2.05	2
27.10.2023	2.06	4
$\bar{Y}$	2.07	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
3	8.88×10^{-16}	9	2.96×10^{-16}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.07	2.96×10^{-16}	1	2.07

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.08	2.07	2.96×10^{-16}	0	0	3.21×10^{-4}
2.08	2.07	2.96×10^{-16}	1	2.96×10^{-16}	1.19×10^{-4}
2.05	2.07	2.96×10^{-16}	2	5.92×10^{-16}	3.95×10^{-4}
2.06	2.07	2.96×10^{-16}	4	1.18×10^{-15}	8.05×10^{-5}
				Σ	9.15×10^{-4}
				s	2.14×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
3	9	3	2.14×10^{-2}	7.13×10^{-3}

$u_{sts} = t * s(b_1)$	2.85×10^{-2}
%	2.85
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	3.07×10^{-2}
|b1|	7.40×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.344. Heptachlor-*endo*-epoxide in mixture II of mix B at +4°C for short-term stability

heptachlor-*endo*-epoxide in mixture II		
Date	**Concentration (2 ppm)**	**Day**
23.10.2023	2.06	0
24.10.2023	2.05	1
25.10.2023	2.06	2
15.11.2023	2.08	18
$\bar{Y}$	2.06	
$\bar{X}$		1

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
17	-8.88×10^{-16}	289	-5.22×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.06	-5.22×10^{-17}	1	2.06

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.06	2.06	-5.22×10^{-17}	0	0	3.01×10^{-5}
2.05	2.06	-5.22×10^{-17}	1	-5.22×10^{-17}	1.32×10^{-4}
2.06	2.06	-5.22×10^{-17}	2	-1.04×10^{-16}	5.37×10^{-7}
2.08	2.06	-5.22×10^{-17}	18	-9.40×10^{-16}	3.13×10^{-4}
				Σ	4.76×10^{-4}
				s	1.54×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	$s(b_1)$
17	289	17	1.54×10^{-2}	9.07×10^{-4}

$u_{sts}=t*s(b_1)$	1.63×10^{-2}
%	1.63
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	3.90×10^{-3}
|b1|	1.40×10^{-3}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.345. HCB in mixture I of mix A at -20°C for long-term stability

HCB in mixture I		
Date	**Concentration (2 ppm)**	**Day**
8.05.2023	2.03	0
10.06.2023	2.05	30
3.07.2023	1.94	60
20.08.2023	2.03	90
2.10.2023	2.01	150
$\bar{Y}$	2.01	
$\bar{X}$		30

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	-8.88×10^{-16}	32400	-4.93×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.01	-4.93×10^{-18}	30	2.01

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.03	2.01	-4.93×10^{-18}	0	0	3.69×10^{-4}
2.05	2.01	-4.93×10^{-18}	30	-1.48×10^{-16}	1.41×10^{-3}
1.94	2.01	-4.93×10^{-18}	60	-2.96×10^{-16}	4.82×10^{-3}
2.03	2.01	-4.93×10^{-18}	90	-4.44×10^{-16}	2.60×10^{-4}
2.01	2.01	-4.93×10^{-18}	150	-7.40×10^{-16}	1.18×10^{-5}
				Σ	6.87×10^{-3}
				s	4.78×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	4.78×10^{-2}	2.66×10^{-4}

$u_{sts}=t*s(b_1)$	3.99×10^{-2}
%	3.99
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	8.45×10^{-4}
|b1|	2.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.346. Metolachlor in mixture I of mix A at -20°C for long-term stability

metolachlor in mixture I		
Date	**Concentration (2 ppm)**	**Day**
8.05.2023	2.39	0
10.06.2023	2.37	30
3.07.2023	2.31	60
21.08.2023	2.23	90
2.10.2023	2.25	150
$\bar{Y}$	2.31	
$\bar{X}$		30

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	8.88×10^{-16}	32400	4.93×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.31	4.93×10^{-18}	30	2.31

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.39	2.31	4.93×10^{-18}	0	0	6.10×10^{-3}
2.37	2.31	4.93×10^{-18}	30	1.48×10^{-16}	3.33×10^{-3}
2.31	2.31	4.93×10^{-18}	60	2.96×10^{-16}	9.00×10^{-3}
2.23	2.31	4.93×10^{-18}	90	4.44×10^{-16}	5.70×10^{-3}
2.25	2.31	4.93×10^{-18}	150	7.40×10^{-16}	3.64×10^{-3}
				Σ	1.88×10^{-2}
				s	7.91×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	7.91×10^{-2}	4.40×10^{-4}

$u_{sts}=t*s(b_1)$	6.59×10^{-2}
%	6.59
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	1.40×10^{-3}
|b1|	1.10×10^{-3}
|b1| < tcrit.*$s(b_1)$	accept as stable

Table 0.347. *alpha*-HCH in mixture II of mix A at -20°C for long-term stability

***alpha*-HCH in mixture II**				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
9.05.2023	102	9.05.2023	2.03	0
10.06.2023	95	10.06.2023	1.93	30
3.07.2023	103	3.07.2023	2.06	60
21.08.2023	101	21.08.2023	2.06	90
2.10.2023	102	2.10.2023	2.03	150
$\bar{Y}$	2.01		2.02	
$\bar{X}$				30

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	0	32400	0

$\bar{Y}$	b_1	$\bar{X}$	b_0
2.01	0	30	2.01

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i-b_0-b_1*X_i)^2$
2.04	2.01	0	0	0	$6.85x10^{-4}$
1.90	2.01	0	30	0	$1.33x10^{-2}$
2.07	2.01	0	60	0	$3.07x10^{-3}$
2.02	2.01	0	90	0	$2.70x10^{-5}$
2.04	2.01	0	150	0	$8.08x10^{-4}$
				Σ	$1.79x10^{-2}$
				s	$7.72x10^{-2}$

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	**s(b_1)**
180	32400	180	$7.72x10^{-2}$	$4.29x10^{-4}$

$u_{sts}=t*s(b_1)$	$6.43x10^{-2}$
%	6.43
tcrit. n-2 at 95 CL	3.18
tcrit. * s(b_1)	$1.36x10^{-3}$
|b1|	$3.00x10^{-4}$
|b1| < tcrit.*s(b_1)	stable

Table 0.347 (continued). *alpha*-HCH in mixture II of mix A at -20°C for long-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	2.22×10^{-16}	32400	1.23×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.02	1.23×10^{-18}	30	2.02

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.03	2.02	1.23×10^{-18}	0	0	7.02×10^{-5}
1.93	2.02	1.23×10^{-18}	30	3.70×10^{-17}	7.84×10^{-3}
2.06	2.02	1.23×10^{-18}	60	7.40×10^{-17}	1.35×10^{-3}
2.06	2.02	1.23×10^{-18}	90	1.11×10^{-16}	1.45×10^{-3}
2.03	2.02	1.23×10^{-18}	150	1.85×10^{-16}	2.98×10^{-5}
				Σ	1.07×10^{-2}
				s	5.98×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	5.98×10^{-2}	3.32×10^{-4}

$u_{sts}=t*s(b_1)$	4.99×10^{-2}
%	4.99
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	1.06×10^{-3}
|b1|	3.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.348. *gamma*-HCH in mixture II of mix A at -20°C for long-term stability

***gamma*-HCH in mixture II**				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
9.05.2023	2.08	9.05.2023	1.98	0
10.06.2023	2.00	10.06.2023	2.08	30
3.07.2023	2.06	3.07.2023	2.05	60
28.08.2023	1.68	21.08.2023	2.02	90
2.10.2023	1.95	2.10.2023	2.02	150
$\bar{Y}$	1.96		2.03	
$\bar{X}$				30

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	6.66×10^{-16}	32400	3.70×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.96	3.70×10^{-18}	30	1.96

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.08	1.96	3.70×10^{-18}	0	0	1.58×10^{-2}
2.00	1.96	3.70×10^{-18}	30	1.11×10^{-16}	2.29×10^{-3}
2.06	1.96	3.70×10^{-18}	60	2.22×10^{-16}	1.08×10^{-2}
1.68	1.96	3.70×10^{-18}	90	3.33×10^{-16}	7.37×10^{-2}
1.95	1.96	3.70×10^{-18}	150	5.55×10^{-16}	3.52×10^{-5}
				Σ	1.03×10^{-1}
				s	1.85×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	**s(b_1)**
180	32400	180	1.85×10^{-1}	1.03×10^{-3}

$u_{sts}=t*s(b_1)$	1.54×10^{-1}
%	15.41
tcrit. n-2 at 95 CL	3.18
tcrit. * s(b_1)	3.27×10^{-3}
|b1|	1.30×10^{-3}
|b1| < tcrit.*s(b_1)	stable

Table 0.348 (continued). *gamma*-HCH in mixture II of mix A at -20°C for long-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	0	32400	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.03	0	30	2.03

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.98	2.03	0	30	0	2.50×10^{-3}
2.08	2.03	0	60	0	2.59×10^{-3}
2.05	2.03	0	90	0	3.82×10^{-4}
2.02	2.03	0	120	0	3.62×10^{-5}
2.02	2.03	0	180	0	2.06×10^{-4}
				Σ	5.72×10^{-3}
				s	4.37×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	4.37×10^{-2}	2.43×10^{-4}

$u_{sts} = t * s(b_1)$	3.64×10^{-2}
%	3.64
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	7.71×10^{-4}
$\|b1\|$	4.00×10^{-7}
$\|b1\| < tcrit. * s(b_1)$	stable

Table 0.349. Aldrin in mixture II of mix A at -20°C for long-term stability

aldrin in mixture II				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
9.05.2023	1.84	8.05.2023	1.96	0
11.06.2023	2.05	11.06.2023	2.07	30
3.07.2023	2.05	3.07.2023	2.03	60
20.08.2023	2.06	21.08.2023	2.06	90
2.10.2023	2.00	2.10.2023	2.02	150
$\bar{Y}$	2.00		2.03	
$\bar{X}$				30

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	$2.22x10^{-16}$	32400	$1.23x10^{-18}$
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.00	$1.23x10^{-18}$	30	2.00

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.84	2.00	$1.23x10^{-18}$	0	0	$2.53x10^{-2}$
2.05	2.00	$1.23x10^{-18}$	30	$3.70x10^{-17}$	$2.52x10^{-3}$
2.05	2.00	$1.23x10^{-18}$	60	$7.40x10^{-17}$	$2.24x10^{-3}$
2.06	2.00	$1.23x10^{-18}$	90	$1.11x10^{-16}$	$3.73x10^{-3}$
2.00	2.00	$1.23x10^{-18}$	150	$1.85x10^{-16}$	$2.89x10^{-7}$
			Σ		$3.38x10^{-2}$
			s		$1.06x10^{-1}$

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	$1.06x10^{-1}$	$5.90x10^{-4}$

$u_{sts}=t*s(b_1)$	$8.84x10^{-2}$
%	8.844
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	$1.87x10^{-3}$
|b1|	$7.00x10^{-4}$
|b1| < tcrit.*$s(b_1)$	stable

Table 0.349 (continued). Aldrin in mixture II of mix A at -20°C for long-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	-2.22×10^{-16}	32400	-1.23×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.03	-1.23×10^{-18}	30	2.03

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.96	2.03	-1.23×10^{-18}	0	0	5.21×10^{-3}
2.07	2.03	-1.23×10^{-18}	30	-3.70×10^{-17}	1.93×10^{-3}
2.03	2.03	-1.23×10^{-18}	60	-7.40×10^{-17}	4.61×10^{-6}
2.06	2.03	-1.23×10^{-18}	90	-1.11×10^{-16}	1.24×10^{-3}
2.02	2.03	-1.23×10^{-18}	150	-1.85×10^{-16}	2.28×10^{-5}
				Σ	8.40×10^{-3}
				s	5.29×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	5.29×10^{-2}	2.94×10^{-4}

$u_{sts}=t*s(b_1)$	4.41×10^{-2}
%	4.411
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	9.35×10^{-4}
|b1|	3.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.350. Dieldrin in mixture II of mix A at -20°C for long-term stability

dieldrin in mixture II				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
9.05.2023	2.09	9.05.2023	2.02	0
11.06.2023	2.07	11.06.2023	2.05	30
3.07.2023	2.03	3.07.2023	2.06	60
20.08.2023	2.12	20.08.2023	2.09	90
2.10.2023	2.10	2.10.2023	2.05	150
$\bar{Y}$	2.08		2.05	
$\bar{X}$				30

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	4.44×10^{-16}	32400	2.47×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.08	2.47×10^{-18}	30	2.08

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.09	2.08	2.47×10^{-18}	0	0	7.68×10^{-5}
2.07	2.08	2.47×10^{-18}	30	7.40×10^{-17}	5.90×10^{-5}
2.03	2.08	2.47×10^{-18}	60	1.48×10^{-16}	2.88×10^{-3}
2.12	2.08	2.47×10^{-18}	90	2.22×10^{-16}	1.13×10^{-3}
2.10	2.08	2.47×10^{-18}	150	3.70×10^{-16}	3.61×10^{-4}
	2.47×10^{-18}			**Σ**	4.51×10^{-3}
				s	3.88×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	3.88×10^{-2}	2.15×10^{-4}

$u_{sts} = t * s(b_1)$	3.23×10^{-2}
%	3.23
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	6.85×10^{-4}
|b1|	2.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.350 (continued). Dieldrin in mixture II of mix A at -20°C for long-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	-8.88×10^{-16}	32400	-4.93×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.05	-4.93×10^{-18}	30	2.05

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.02	2.05	-4.93×10^{-18}	0	0	1.43×10^{-3}
2.05	2.05	-4.93×10^{-18}	30	-1.48×10^{-16}	5.08×10^{-5}
2.06	2.05	-4.93×10^{-18}	60	-2.96×10^{-16}	9.44×10^{-5}
2.09	2.05	-4.93×10^{-18}	90	-4.44×10^{-16}	1.41×10^{-3}
2.05	2.05	-4.93×10^{-18}	150	-7.40×10^{-16}	5.40×10^{-6}
				Σ	2.99×10^{-3}
				s	3.16×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	3.16×10^{-2}	1.75×10^{-4}

$u_{sts} = t * s(b_1)$	2.63×10^{-2}
%	2.63
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	5.58×10^{-4}
|b1|	3.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.351. Endrin in mixture II of mix A at -20°C for long-term stability

endrin in mixture II				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
11.05.2023	2.19	11.05.2023	2.20	0
10.06.2023	2.05	10.06.2023	2.02	30
3.07.2023	2.03	3.07.2023	1.93	60
20.08.2023	2.00	28.08.2023	2.03	90
$\bar{Y}$	2.07		2.05	
$\bar{X}$				30

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
60	-1.11×10^{-15}	3600	-1.85×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.07	-1.85×10^{-17}	30	2.07

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.19	2.07	-1.85×10^{-17}	0	0	1.58×10^{-2}
2.05	2.07	-1.85×10^{-17}	30	-5.55×10^{-16}	3.21×10^{-4}
2.03	2.07	-1.85×10^{-17}	60	-1.11×10^{-15}	1.61×10^{-3}
2.00	2.07	-1.85×10^{-17}	90	-1.67×10^{-15}	4.57×10^{-3}
				Σ	2.23×10^{-2}
				s	1.06×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
60	3600	60	1.06×10^{-1}	1.76×10^{-3}

$u_{sts}=t*s(b_1)$	1.58×10^{-1}
%	15.83
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	7.56×10^{-3}
|b1|	2.00×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.351 (continued). Endrin in mixture II of mix A at -20°C for long-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
60	$8.88x10^{-16}$	3600	$1.48x10^{-17}$
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.05	$1.48x10^{-17}$	30	2.05

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.20	2.05	$1.48x10^{-17}$	30	$4.44x10^{-16}$	$2.44x10^{-2}$
2.02	2.05	$1.48x10^{-17}$	60	$8.88x10^{-16}$	$6.40x10^{-4}$
1.93	2.05	$1.48x10^{-17}$	90	$1.33x10^{-15}$	$1.33x10^{-2}$
2.03	2.05	$1.48x10^{-17}$	120	$1.78x10^{-15}$	$2.46x10^{-4}$
				Σ	$3.86x10^{-2}$
				s	$1.39x10^{-1}$

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
60	3600	60	$1.39x10^{-1}$	$2.32x10^{-3}$

$u_{sts}=t*s(b_1)$	$2.08x10^{-1}$
%	20.84
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	$9.95x10^{-3}$
$\|b1\|$	$2.00x10^{-3}$
$\|b1\| < tcrit.*s(b_1)$	stable

Table 0.352. 4,4'-DDD in mixture II of mix A at -20°C for long-term stability

4,4'-DDD in mixture II				
First Bottle		Second Bottle		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
9.05.2023	2.30	9.05.2023	2.28	0
11.06.2023	2.06	11.06.2023	2.07	30
3.07.2023	2.09	3.07.2023	2.09	60
21.08.2023	2.12	21.08.2023	2.13	90
2.10.2023	2.04	2.10.2023	2.12	150
$\bar{Y}$	2.12		2.14	
$\bar{X}$				30

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	8.88×10^{-16}	32400	4.93×10^{-18}

$\bar{Y}$	b_1	$\bar{X}$	b_0
2.12	4.93×10^{-18}	30	2.12

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.30	2.12	4.93×10^{-18}	0	0	3.24×10^{-2}
2.06	2.12	4.93×10^{-18}	30	1.48×10^{-16}	3.60×10^{-3}
2.09	2.12	4.93×10^{-18}	60	2.96×10^{-16}	9.51×10^{-4}
2.12	2.12	4.93×10^{-18}	90	4.44×10^{-16}	2.23×10^{-5}
2.04	2.12	4.93×10^{-18}	150	7.40×10^{-16}	7.12×10^{-3}
				Σ	4.41×10^{-2}
				s	1.21×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	1.21×10^{-1}	6.73×10^{-4}

$u_{sts}=t*s(b_1)$	1.01×10^{-1}
%	10.10
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	2.14×10^{-3}
|b1|	1.30×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.352 (continued). 4,4'-DDD in mixture II of mix A at -20°C for long-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	4.44×10^{-16}	32400	2.47×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.14	2.47×10^{-18}	30	2.14

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.02	2.14	2.47×10^{-18}	30	7.40×10^{-17}	1.45×10^{-2}
2.05	2.14	2.47×10^{-18}	60	1.48×10^{-16}	8.06×10^{-3}
2.06	2.14	2.47×10^{-18}	90	2.22×10^{-16}	5.32×10^{-3}
2.09	2.14	2.47×10^{-18}	120	2.96×10^{-16}	2.03×10^{-3}
2.05	2.14	2.47×10^{-18}	180	4.44×10^{-16}	7.22×10^{-3}
				Σ	3.71×10^{-2}
				s	1.11×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	1.11×10^{-1}	6.18×10^{-4}

$u_{sts} = t * s(b_1)$	9.27×10^{-2}
%	9.27
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	1.97×10^{-3}
$\|b1\|$	7.00×10^{-4}
$\|b1\| < tcrit. * s(b_1)$	stable

Table 0.353. 4,4'-DDT in mixture II of mix A at -20°C for long-term stability

4,4'-DDT in mixture II				
First Bottle		Second Bottle		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
9.05.2023	2.47	9.05.2023	2.48	0
11.06.2023	2.11	11.06.2023	2.11	30
3.07.2023	2.09	3.07.2023	2.08	60
28.08.2023	2.12	20.08.2023	2.30	90
2.10.2023	2.55			150
$\bar{Y}$	2.27		2.24	
$\bar{X}$				30

First Bottle

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	-4.44×10^{-16}	32400	-2.47×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.27	-2.47×10^{-18}	30	2.27

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.47	2.27	-2.47×10^{-18}	0	0	4.23×10^{-2}
2.11	2.27	-2.47×10^{-18}	30	-7.40×10^{-17}	2.54×10^{-2}
2.09	2.27	-2.47×10^{-18}	60	-1.48×10^{-16}	3.22×10^{-2}
2.12	2.27	-2.47×10^{-18}	90	-2.22×10^{-16}	2.22×10^{-2}
2.55	2.27	-2.47×10^{-18}	150	-3.70×10^{-16}	7.95×10^{-2}
				Σ	2.02×10^{-1}
				s	2.59×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	2.59×10^{-1}	1.44×10^{-3}

$u_{sts}=t*s(b_1)$	2.16×10^{-1}
%	21.6
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	4.58×10^{-3}
|b1|	1.30×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.353 (continued). 4,4'-DDT in mixture II of mix A at -20°C for long-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
60	4.44×10^{-16}	3600	7.40×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.24	7.40×10^{-18}	30	2.24408

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.48	2.24	7.40×10^{-18}	0	0	5.66×10^{-2}
2.11	2.24	7.40×10^{-18}	30	2.22×10^{-16}	1.74×10^{-2}
2.08	2.24	7.40×10^{-18}	60	4.44×10^{-16}	2.66×10^{-2}
2.30	2.24	7.40×10^{-18}	90	6.66×10^{-16}	3.29×10^{-3}
				Σ	1.04×10^{-1}
				s	2.28×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
60	3600	60	2.28×10^{-1}	3.80×10^{-3}

$u_{sts} = t * s(b_1)$	5.70×10^{-1}
%	57.0084
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.63×10^{-2}
$\|b1\|$	1.90×10^{-3}
$\|b1\| < tcrit. * s(b_1)$	stable

Table 0.354. 2,4'-DDT in mixture II of mix A at -20°C for long-term stability

2,4'-DDT in mixture II				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
9.05.2023	2.51	9.05.2023	2.49	0
11.06.2023	2.16	11.06.2023	2.23	30
3.07.2023	2.16	3.07.2023	2.11	60
28.08.2023	2.13	28.08.2023	2.28	90
2.10.2023	2.50	2.10.2023	2.69	150
$\bar{Y}$	2.29		2.36	
$\bar{X}$				30

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	4.44×10^{-16}	32400	2.47×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.29	2.47×10^{-18}	30	2.29

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.51	2.29	2.47×10^{-18}	0	0	4.78×10^{-2}
2.16	2.29	2.47×10^{-18}	30	7.40×10^{-17}	1.65×10^{-2}
2.16	2.29	2.47×10^{-18}	60	1.48×10^{-16}	1.81×10^{-2}
2.13	2.29	2.47×10^{-18}	90	2.22×10^{-16}	2.49×10^{-2}
2.50	2.29	2.47×10^{-18}	150	3.70×10^{-16}	4.09×10^{-2}
				Σ	1.48×10^{-1}
				s	2.22×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	2.22×10^{-1}	1.23×10^{-3}

$u_{sts}=t*s(b_1)$	1.85×10^{-1}
%	18.52
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	3.93×10^{-3}
|b1|	3.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.354 (continued). 2,4'-DDT in mixture II of mix A at -20°C long-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	1.78x10-15	32400	$9.87x10^{-18}$
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.36	$9.87x10^{-18}$	30	2.36

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i-b_0-b_1*X_i)^2$
2.49	2.36	$9.87x10^{-18}$	0	0	$1.15x10^{-1}$
2.23	2.36	$9.87x10^{-18}$	30	$-8.33x10^{-3}$	$8.31x10^{-3}$
2.11	2.36	$9.87x10^{-18}$	60	$-1.67x10^{-2}$	$5.75x10^{-4}$
2.28	2.36	$9.87x10^{-18}$	90	$-2.50x10^{-2}$	$2.51x10^{-2}$
2.69	2.36	$9.87x10^{-18}$	150	$-4.16x10^{-2}$	$3.42x10^{-1}$
				Σ	$4.92x10^{-1}$
				s	$4.05x10^{-1}$

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	$4.05x10^{-1}$	$2.25x10^{-3}$

$u_{sts}=t*s(b_1)$	$3.37x10^{-1}$
%	33.73
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	$7.15x10^{-3}$
|b1|	$1.80x10^{-3}$
|b1| < tcrit.*$s(b_1)$	stable

Table 0.355. *alpha*-Endosulfan in mixture II of mix A at -20°C for long-term stability

***alpha*-endosulfan in mixture II**				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
9.05.2023	2.01	9.05.2023	2.02	0
11.06.2023	2.02	11.06.2023	2.04	30
3.07.2023	1.99	3.07.2023	1.88	60
20.08.2023	1.93	21.08.2023	2.07	90
2.10.2023	2.04	2.10.2023	2.01	150
$\bar{Y}$	2.00		2.00	
$\bar{X}$				30

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	-4.44×10^{-16}	32400	-2.47×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.00	-2.47×10^{-18}	30	2.00

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.01	2.00	-2.47×10^{-18}	0	0	2.86×10^{-4}
2.02	2.00	-2.47×10^{-18}	30	-7.40×10^{-17}	4.19×10^{-4}
1.99	2.00	-2.47×10^{-18}	60	-1.48×10^{-16}	2.72×10^{-5}
1.93	2.00	-2.47×10^{-18}	90	-2.22×10^{-16}	5.20×10^{-3}
2.04	2.00	-2.47×10^{-18}	150	-3.70×10^{-16}	1.60×10^{-3}
				Σ	7.53×10^{-3}
				s	5.01×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	$s(b_1)$
180	32400	180	5.01×10^{-2}	2.78×10^{-4}

$u_{sts}=t*s(b_1)$	4.17×10^{-2}
%	4.17
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	8.85×10^{-4}
|b1|	1.00×10^{-5}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.355 (continued). *alpha*-Endosulfan in mixture II of mix A at -20°C long-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	-2.22×10^{-15}	32400	-1.23×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.00	-1.23×10^{-17}	30	2.00

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.02	2.00	1.23×10^{-17}	0	0	3.31×10^{-4}
2.04	2.00	1.23×10^{-17}	30	-3.70×10^{-16}	1.51×10^{-3}
1.88	2.00	1.23×10^{-17}	60	-7.40×10^{-16}	1.52×10^{-2}
2.07	2.00	1.23×10^{-17}	90	-1.11×10^{-15}	3.99×10^{-3}
2.01	2.00	1.23×10^{-17}	150	-1.85×10^{-15}	8.70×10^{-6}
				Σ	2.10×10^{-2}
				s	8.36×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	8.36×10^{-2}	4.65×10^{-4}

$u_{sts}=t*s(b_1)$	6.97×10^{-2}
%	6.97
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	1.48×10^{-3}
|b1|	7.00×10^{-6}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.356. *beta*-Endosulfan in mixture II of mix A at -20°C for long-term stability

***beta*-endosulfan in mixture II**				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
9.05.2023	2.00	9.05.2023	1.97	0
11.06.2023	2.04	11.06.2023	2.05	30
3.07.2023	2.04	3.07.2023	1.94	60
21.08.2023	1.89	21.08.2023	2.06	90
2.10.2023	2.04	2.10.2023	2.05	150
$\bar{Y}$	2.00		2.01	
$\bar{X}$				30

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	$1.33x10^{-15}$	32400	$7.40x10^{-18}$
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.00	$7.40x10^{-18}$	30	2.00

Yi	**b_0**	**b_1**	**X_i**	**$b_1 * X_i$**	**$(Y_i-b_0-b_1*X_i)^2$**
2.00	2.00	$7.40x10^{-18}$	0	0	$1.74x10^{-6}$
2.04	2.00	$7.40x10^{-18}$	30	$2.22x10^{-16}$	$1.69x10^{-3}$
2.04	2.00	$7.40x10^{-18}$	60	$4.44x10^{-16}$	$1.07x10^{-3}$
1.89	2.00	$7.40x10^{-18}$	90	$6.66x10^{-16}$	$1.31x10^{-2}$
2.04	2.00	$7.40x10^{-18}$	150	$1.11x10^{-15}$	$1.75x10^{-3}$
				Σ	$1.76x10^{-2}$
				s	$7.66x10^{-2}$

$\Sigma X_i - \bar{X}$	**$(\Sigma X_i - \bar{X})^2$**	**$\sqrt{((\Sigma X_i - \bar{X})^2)}$**	**s**	**$s(b_1)$**
180	32400	180	$7.66x10^{-2}$	$4.25x10^{-4}$

$u_{sts}=t*s(b_1)$	$6.38x10^{-2}$
%	6.38
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	$1.35x10^{-3}$
|b1|	$6.00x10^{-5}$
|b1| < tcrit.*$s(b_1)$	stable

Table 0.356 (continued). *beta*-Endosulfan in mixture II of mix A at -20°C long-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	2.00×10^{-15}	32400	1.11×10^{-17}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.01	1.11×10^{-17}	30	2.01

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.97	2.01	1.11×10^{-17}	0	0	1.75×10^{-3}
2.05	2.01	1.11×10^{-17}	30	3.33×10^{-16}	1.19×10^{-3}
1.94	2.01	1.11×10^{-17}	60	6.66×10^{-16}	5.14×10^{-3}
2.06	2.01	1.11×10^{-17}	90	9.99×10^{-16}	1.85×10^{-3}
2.05	2.01	1.11×10^{-17}	150	1.67×10^{-15}	1.30×10^{-3}
				Σ	1.12×10^{-2}
				s	6.12×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	6.12×10^{-2}	3.40×10^{-4}

$u_{sts}=t*s(b_1)$	5.10×10^{-2}
%	5.10
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	1.08×10^{-3}
|b1|	5.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.357. Heptachlor in mixture II of mix A at -20°C for long-term stability

heptachlor in mixture II				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
9.05.2023	2.45	9.05.2023	2.45	0
11.06.2023	2.01	11.06.2023	2.05	30
3.07.2023	1.77	3.07.2023	1.70	60
21.08.2023	2.07	20.08.2023	2.07	90
$\bar{Y}$	2.07		2.07	
$\bar{X}$				30

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
60	0	3600	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.07	0	30	2.07

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.45	2.07	0	0	0	1.40×10^{-1}
2.01	2.07	0	30	0	4.18×10^{-3}
1.77	2.07	0	60	0	9.26×10^{-2}
2.07	2.07	0	90	0	2.26×10^{-5}
				Σ	2.36×10^{-1}
				s	3.44×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
60	3600	60	3.44×10^{-1}	5.73×10^{-3}

$u_{sts}=t*s(b_1)$	5.16×10^{-1}
%	51.57
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	2.46×10^{-2}
|b1|	5.00×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.357 (continued). Heptachlor in mixture II of mix A at -20°C for short-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
60	$1.78x10^{-15}$	3600	$2.96x10^{-17}$
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.07	$2.96x10^{-17}$	30	2.07

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.45	2.07	$2.96x10^{-17}$	0	0	$1.43x10^{-1}$
2.05	2.07	$2.96x10^{-17}$	30	$8.88x10^{-16}$	$5.32x10^{-4}$
1.70	2.07	$2.96x10^{-17}$	60	$1.78x10^{-15}$	$1.42x10^{-1}$
2.07	2.07	$2.96x10^{-17}$	90	$2.66x10^{-15}$	$7.48x10^{-7}$
				Σ	$2.86x10^{-1}$
				s	$3.78x10^{-1}$

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
60	3600	60	$3.78x10^{-1}$	$6.30x10^{-3}$

$u_{sts}=t*s(b_1)$	$5.67x10^{-1}$
%	56.68
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	$2.71x10^{-2}$
$\|b1\|$	$5.00x10^{-3}$
$\|b1\| < tcrit.*s(b_1)$	stable

Table 0.358. Heptachlor-*endo*-epoxide in mixture II of mix A at -20°C for long-term stability

heptachlor-*endo*-epoxide in mixture II				
First Bottle		**Second Bottle**		
Date	**Concentration (2 ppm)**	**Date**	**Concentration (2 ppm)**	**Day**
9.05.2023	2.06	9.05.2023	2.03	0
11.06.2023	2.09	11.06.2023	2.09	30
3.07.2023	2.03	3.07.2023	2.02	60
28.08.2023	2.03	28.08.2023	2.02	90
2.10.2023	2.01	2.10.2023	2.02	150
$\bar{Y}$	2.05		2.04	
$\bar{X}$				30

First Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	4.44×10^{-16}	32400	2.47×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.05	2.47×10^{-18}	30	2.05

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.06	2.05	2.47×10^{-18}	0	0	1.91×10^{-4}
2.09	2.05	2.47×10^{-18}	30	7.40×10^{-17}	2.15×10^{-3}
2.03	2.05	2.47×10^{-18}	60	1.48×10^{-16}	1.25×10^{-4}
2.03	2.05	2.47×10^{-18}	90	2.22×10^{-16}	2.22×10^{-4}
2.01	2.05	2.47×10^{-18}	150	3.70×10^{-16}	1.17×10^{-3}
				Σ	3.86×10^{-3}
				s	3.59×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	3.59×10^{-2}	1.99×10^{-4}

$u_{sts}=t*s(b_1)$	2.99×10^{-2}
%	2.99
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	6.33×10^{-4}
|b1|	4.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.358 (continued). Heptachlor-*endo*-epoxide in mixture II of mix A at -20°C for long-term stability

Second Bottle			
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	0	32400	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.04	0	30	2.04

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.03	2.04	0	0	0	9.43×10^{-5}
2.09	2.04	0	30	0	2.93×10^{-3}
2.02	2.04	0	60	0	1.35×10^{-4}
2.02	2.04	0	90	0	1.90×10^{-4}
2.02	2.04	0	150	0	3.61×10^{-4}
				Σ	3.71×10^{-3}
				s	3.51×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	3.51×10^{-2}	1.95×10^{-4}

$u_{sts} = t * s(b_1)$	2.93×10^{-2}
%	2.93
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	6.21×10^{-4}
|b1|	2.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.359. HCB in mixture I of mix B at -20°C for long-term stability

HCB in mixture I		
Date	**Concentration (2 ppm)**	**Day**
9.05.2023	1.99	0
10.06.2023	2.05	30
3.07.2023	2.03	60
2.10.2023	1.79	150
$\bar{Y}$	1.96	
$\bar{X}$		30

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
120	-2.22×10^{-16}	14400	-1.85×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.96	-1.85×10^{-18}	30	1.96

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.99	1.96	-1.85×10^{-18}	0	0	6.81×10^{-4}
2.05	1.96	-1.85×10^{-18}	30	-5.55×10^{-17}	7.26×10^{-3}
2.03	1.96	-1.85×10^{-18}	60	-1.11×10^{-16}	4.57×10^{-3}
1.79	1.96	-1.85×10^{-18}	90	-1.67×10^{-16}	3.20×10^{-2}
				Σ	4.45×10^{-2}
				s	1.49×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
120	14400	120	1.49×10^{-1}	1.24×10^{-3}

$u_{sts}=t*s(b_1)$	1.12×10^{-1}
%	11.19
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	5.34×10^{-3}
|b1|	1.60×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.360. Metolachlor in mixture I of mix B at -20°C for long-term stability

metolachlor in mixture I		
Date	**Concentration (2 ppm)**	**Day**
11.06.2023	2.29	30
3.07.2023	2.09	60
20.08.2023	2.08	90
2.10.2023	2.23	150
$\bar{Y}$	2.17	
$\bar{X}$		30

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
210	0	44100	0
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.17	0	30	2.17

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.29	2.17	0	0	0	1.40×10^{-2}
2.09	2.17	0	30	0	7.17×10^{-3}
2.08	2.17	0	60	0	8.75×10^{-3}
2.23	2.17	0	90	0	3.56×10^{-3}
				Σ	3.35×10^{-2}
				s	1.29×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
210	44100	210	1.29×10^{-1}	6.16×10^{-4}

$u_{sts} = t * s(b_1)$	9.25×10^{-2}
%	9.25
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	2.65×10^{-3}
|b1|	1.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.361. *alpha*-HCH in mixture II of mix B at -20°C for long-term stability

***alpha*-HCH in mixture II**		
Date	**Concentration (2 ppm)**	**Day**
9.05.2023	2.00	0
11.06.2023	2.14	30
3.07.2023	2.01	60
21.08.2023	2.02	90
2.10.2023	2.03	150
$\bar{Y}$	2.04	
$\bar{X}$		30

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	1.33×10^{-15}	32400	7.40×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.04	7.40×10^{-18}	30	2.04

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.00	2.04	7.40×10^{-18}	0	0	1.81×10^{-3}
2.14	2.04	7.40×10^{-18}	30	2.22×10^{-16}	1.06×10^{-2}
2.01	2.04	7.40×10^{-18}	60	4.44×10^{-16}	9.22×10^{-4}
2.02	2.04	7.40×10^{-18}	90	6.66×10^{-16}	3.87×10^{-4}
2.03	2.04	7.40×10^{-18}	150	1.11×10^{-15}	1.03×10^{-4}
				Σ	1.38×10^{-2}
				s	6.78×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	6.78×10^{-2}	3.77×10^{-4}

$u_{sts}=t*s(b_1)$	5.65×10^{-2}
%	5.65
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	1.20×10^{-3}
|b1|	2.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.362. *gamma*-HCH in mixture II of mix B at -20°C for long-term stability

***gamma*-HCH in mixture II**		
Date	**Concentration (2 ppm)**	**Day**
9.05.2023	1.99	0
10.06.2023	2.06	30
3.07.2023	1.82	60
20.08.2023	2.01	90
2.10.2023	2.06	150
$\bar{Y}$	1.90	
$\bar{X}$		30

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	-6.66×10^{-16}	32400	-3.70×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.99	-3.70×10^{-18}	30	1.99

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.99	1.99	-3.70×10^{-18}	0	0	1.50×10^{-5}
2.06	1.99	-3.70×10^{-18}	30	-1.11×10^{-16}	5.12×10^{-3}
1.82	1.99	-3.70×10^{-18}	60	-2.22×10^{-16}	2.94×10^{-2}
2.01	1.99	-3.70×10^{-18}	90	-3.33×10^{-16}	6.30×10^{-4}
				Σ	4.02×10^{-2}
				s	1.16×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	1.16×10^{-1}	6.43×10^{-4}

$u_{sts}=t*s(b_1)$	9.65×10^{-2}
%	9.65
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	2.04×10^{-3}
|b1|	4.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.363. Aldrin in mixture II of mix B at -20°C for long-term stability

aldrin in mixture II		
Date	**Concentration (2 ppm)**	**Day**
9.05.2023	1.99	0
11.06.2023	2.04	30
3.07.2023	1.84	60
20.08.2023	1.99	90
2.10.2023	1.89	150
$\bar{Y}$	1.95	
$\bar{X}$		30

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	4.44×10^{-16}	289.00	2.47×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.95	2.47×10^{-18}	30	1.95

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
1.99	1.95	2.47×10^{-18}	0	0	1.51×10^{-3}
2.04	1.95	2.47×10^{-18}	30	7.40×10^{-17}	8.30×10^{-3}
1.84	1.95	2.47×10^{-18}	60	1.48×10^{-16}	1.23×10^{-2}
1.99	1.95	2.47×10^{-18}	90	2.22×10^{-16}	1.90×10^{-3}
1.89	1.95	2.47×10^{-18}	150	3.70×10^{-16}	3.95×10^{-3}
				Σ	2.80×10^{-2}
				s	9.65×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	9.65×10^{-2}	5.36×10^{-4}

$u_{sts}=t*s(b_1)$	8.04×10^{-2}
%	8.04
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	1.71×10^{-3}
|b1|	7.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.364. Dieldrin in mixture II of mix B at -20°C for long-term stability

dieldrin in mixture II		
Date	**Concentration (2 ppm)**	**Day**
8.05.2023	2.23	0
10.06.2023	2.06	30
3.07.2023	2.03	60
20.08.2023	2.02	90
2.10.2023	2.04	150

$\bar{Y}$	2.08
$\bar{X}$	30

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	8.88×10^{-16}	32400	4.93×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.08	4.93×10^{-18}	30	2.08

Y_i	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.23	2.08	4.93×10^{-18}	0	0	2.38×10^{-2}
2.06	2.08	4.93×10^{-18}	30	1.48×10^{-16}	1.88×10^{-4}
2.03	2.08	4.93×10^{-18}	60	2.96×10^{-16}	1.95×10^{-3}
2.02	2.08	4.93×10^{-18}	90	4.44×10^{-16}	3.89×10^{-3}
2.04	2.08	4.93×10^{-18}	150	7.40×10^{-16}	1.17×10^{-3}
				Σ	3.10×10^{-2}
				s	1.02×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	1.02×10^{-1}	5.65×10^{-4}

$u_{sts}=t*s(b_1)$	8.48×10^{-2}
%	8.48
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	1.80×10^{-3}
|b1|	1.00×10^{-3}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.365. Endrin in mixture II of mix B at -20°C for long-term stability

endrin in mixture II		
Date	**Concentration (2 ppm)**	**Day**
11.05.2023	2.30	0
10.06.2023	2.08	30
3.07.2023	2.10	60
28.08.2023	2.05	90
2.10.2023	2.15	150
`Y	2.14	
$\bar{X}$		30

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	$1.67x10^{-1}$	32400	$9.26x10^{-4}$
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.14	$9.26x10^{-4}$	30	2.11

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i-b_0-b_1*X_i)^2$
2.30	2.11	$9.26x10^{-4}$	0	0	$3.84x10^{-2}$
2.08	2.11	$9.26x10^{-4}$	30	$2.78x10^{-2}$	$3.62x10^{-3}$
2.10	2.11	$9.26x10^{-4}$	60	$5.56x10^{-2}$	$4.30x10^{-3}$
2.05	2.11	$9.26x10^{-4}$	90	$8.34x10^{-2}$	$1.90x10^{-2}$
2.15	2.11	$9.26x10^{-4}$	150	$1.39x10^{-1}$	$9.79x10^{-3}$
				Σ	$7.51x10^{-2}$
				s	$1.58x10^{-1}$

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	$1.58x10^{-1}$	$8.79x10^{-4}$

$u_{sts}=t*s(b_1)$	$1.32x10^{-1}$
%	13.18
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	$2.79x10^{-3}$
|b1|	$7.00x10^{-4}$
|b1| < tcrit.*$s(b_1)$	stable

Table 0.366. 4,4'-DDD in mixture I of mix B at -20°C for long-term stability

4,4'-DDD in mixture II		
Date	**Concentration (2 ppm)**	**Day**
8.05.2023	2.29	0
11.06.2023	2.01	30
3.07.2023	2.02	60
20.08.2023	1.96	90
2.10.2023	2.00	150
$\bar{Y}$	2.06	
$\bar{X}$		30

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1		
180	1.33×10^{-15}	32400	7.40×10^{-18}		
$\bar{Y}$	b_1	$\bar{X}$	b_0		
2.06	7.40×10^{-18}	30	2.06		
Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.29	2.06	7.40×10^{-18}	0	0	5.44×10^{-2}
2.01	2.06	7.40×10^{-18}	30	2.22×10^{-16}	1.98×10^{-3}
2.02	2.06	7.40×10^{-18}	60	4.44×10^{-16}	1.59×10^{-3}
1.96	2.06	7.40×10^{-18}	90	6.66×10^{-16}	8.50×10^{-3}
2.00	2.06	7.40×10^{-18}	150	1.11×10^{-15}	3.20×10^{-3}
				Σ	6.96×10^{-2}
				s	1.52×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	1.52×10^{-1}	8.46×10^{-4}

$u_{sts}=t*s(b_1)$	1.27×10^{-1}
%	12.69
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	2.69×10^{-3}
|b1|	1.50×10^{-3}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.367. 4,4'-DDT in mixture II of mix B at -20°C for long-term stability

4,4'-DDT in mixture II		
Date	**Concentration (2 ppm)**	**Day**
10.06.2023	2.06	30
3.07.2023	1.95	60
21.08.2023	2.08	90
2.10.2023	2.25	150
$\bar{Y}$	2.08	
$\bar{X}$		30

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
210	-6.66×10^{-16}	44100	-3.17×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.08	-3.17×10^{-18}	30	2.08

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.06	2.08	-3.17×10^{-18}	30	-9.52×10^{-17}	6.77×10^{-4}
1.95	2.08	-3.17×10^{-18}	60	-1.90×10^{-16}	1.71×10^{-2}
2.08	2.08	-3.17×10^{-18}	90	-2.85×10^{-16}	2.47×10^{-5}
2.25	2.08	-3.17×10^{-18}	150	-4.76×10^{-16}	2.62×10^{-2}
				Σ	4.40×10^{-2}
				s	1.48×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
210	44100	210	1.48x10-1	7.06x10-4

$u_{sts}=t*s(b_1)$	1.06×10^{-1}
%	10.59
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	3.04×10^{-3}
|b1|	1.90×10^{-3}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.368. 2,4'-DDT in mixture II of mix B at -20°C for long-term stability

2,4'-DDT in mixture II		
Date	**Concentration (2 ppm)**	**Day**
11.06.2023	2.15	30
3.07.2023	2.17	60
21.08.2023	2.17	90
2.10.2023	2.27	150

$\bar{Y}$	2.19
$\bar{X}$	30

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
210	8.88×10^{-16}	44100	4.23×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.19	4.23×10^{-18}	30	2.19

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.15	2.19	4.23×10^{-18}	30	1.27×10^{-16}	1.85×10^{-3}
2.17	2.19	4.23×10^{-18}	60	2.54×10^{-16}	5.12×10^{-4}
2.17	2.19	4.23×10^{-18}	90	3.81×10^{-16}	3.06×10^{-4}
2.27	2.19	4.23×10^{-18}	150	6.34×10^{-16}	6.91×10^{-3}
				Σ	9.57×10^{-3}
				s	6.92×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	$s(b_1)$
210	44100	210	6.92×10^{-2}	3.29×10^{-4}

$u_{sts} = t * s(b_1)$	4.94×10^{-2}
%	4.94
tcrit. n-2 at 95 CL	4.3
tcrit. * $s(b_1)$	1.42×10^{-3}
|b1|	1.00×10^{-3}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.369. *alpha*-Endosulfan in mixture II of mix B at -20°C for long-term stability

***alpha*-endosulfan in mixture II**		
Date	**Concentration (2 ppm)**	**Day**
9.05.2023	2.02	0
11.06.2023	2.02	30
3.07.2023	1.66	60
28.08.2023	1.80	90
2.10.2023	1.99	150
$\bar{Y}$	1.90	
$\bar{X}$		30

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	-2.22×10^{-16}	32400	-1.23×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.90	-1.23×10^{-18}	30	1.90

Y_i	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.02	1.90	-1.23×10^{-18}	0	0	1.43×10^{-2}
2.02	1.90	-1.23×10^{-18}	30	-3.70×10^{-17}	1.56×10^{-2}
1.66	1.90	-1.23×10^{-18}	60	-7.40×10^{-17}	5.71×10^{-2}
1.80	1.90	-1.23×10^{-18}	90	-1.11×10^{-16}	9.60×10^{-3}
1.99	1.90	-1.23×10^{-18}	150	-1.85×10^{-16}	8.54×10^{-3}
				Σ	1.05×10^{-1}
				s	1.87×10^{-1}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	**s**	$s(b_1)$
180	32400	180	1.87×10^{-1}	1.04×10^{-3}

$u_{sts}=t*s(b_1)$	1.56×10^{-1}
%	15.60
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	3.31×10^{-3}
|b1|	4.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.370. *beta*-Endosulfan in mixture II of mix B at -20°C for long-term stability

***beta*-endosulfan in mixture I**		
Date	**Concentration (2 ppm)**	**Day**
8.05.2023	2.02	0
10.06.2023	2.02	30
3.07.2023	1.83	60
21.08.2023	2.01	90
2.10.2023	2.07	150
$\bar{Y}$	1.99	
$\bar{X}$		30

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	-8.88×10^{-16}	32400	-4.93×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
1.99	-4.93×10^{-18}	30	1.99

Y_i	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.00	1.99	-4.93×10^{-18}	0	0	1.06×10^{-4}
2.04	1.99	-4.93×10^{-18}	30	-1.48×10^{-16}	2.78×10^{-3}
2.04	1.99	-4.93×10^{-18}	60	-2.96×10^{-16}	1.96×10^{-3}
1.89	1.99	-4.93×10^{-18}	90	-4.44×10^{-16}	1.06×10^{-2}
2.04	1.99	-4.93×10^{-18}	150	-7.40×10^{-16}	2.86×10^{-3}
				Σ	1.83×10^{-2}
				s	7.80×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	7.80×10^{-2}	4.33×10^{-4}

$u_{sts}=t*s(b_1)$	6.50×10^{-2}
%	6.50
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	1.38×10^{-3}
|b1|	4.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	Stable

Table 0.371. Heptachlor in mixture II of mix B at -20°C for long-term stability

heptachlor in mixture II		
Date	**Concentration (2 ppm)**	**Day**
10.06.2023	2.02	30
28.08.2023	2.00	90
2.10.2023	2.07	150
$\bar{Y}$	2.03	
$\bar{X}$		30

$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	-4.44×10^{-16}	32400	-2.47×10^{-18}
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.03	-2.47×10^{-18}	30	2.03

Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i - b_0 - b_1 * X_i)^2$
2.02	2.03	-2.47×10^{-18}	30	-7.40×10^{-17}	6.85×10^{-5}
2.00	2.03	-2.47×10^{-18}	90	-2.22×10^{-16}	8.09×10^{-4}
2.07	2.03	-2.47×10^{-18}	150	-3.70×10^{-16}	1.35×10^{-3}
				Σ	2.23×10^{-3}
				s	4.72×10^{-2}

$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	4.72×10^{-2}	2.62×10^{-4}

$u_{sts}=t*s(b_1)$	3.93×10^{-2}
%	3.93
tcrit. n-2 at 95 CL	12.7
tcrit. * $s(b_1)$	3.33×10^{-3}
|b1|	4.00×10^{-4}
|b1| < tcrit.*$s(b_1)$	stable

Table 0.372. Heptachlor-*endo*-epoxide in mixture II of mix B at -20°C for long-term stability

heptachlor-*endo*-epoxide in mixture II		
Date	**Concentration (2 ppm)**	**Day**
9.05.2023	2.02	0
11.06.2023	2.04	30
3.07.2023	1.98	60
28.08.2023	1.96	90
2.10.2023	2.08	150

$\bar{Y}$	2.02
$\bar{X}$	30

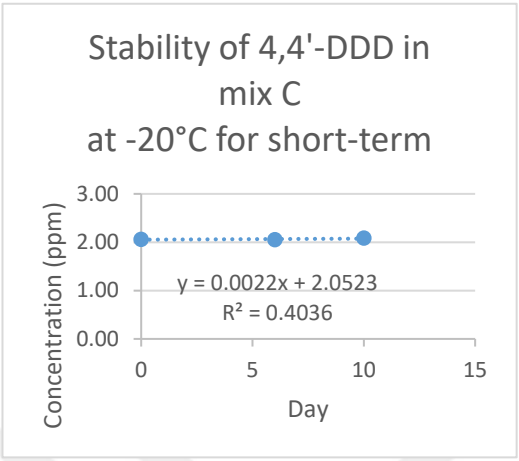
$\Sigma X_i - \bar{X}$	$\Sigma Y_i - \bar{Y}$	$(\Sigma X_i - \bar{X})^2$	b_1
180	-1.33x10-15	32400	-7.40x10-18
$\bar{Y}$	b_1	$\bar{X}$	b_0
2.02	-7.40x10-18	30	2.02

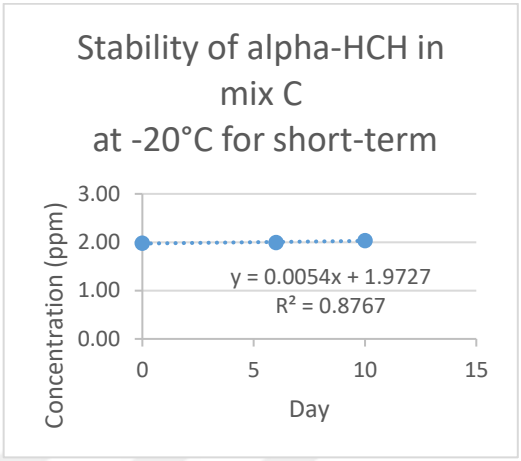
Yi	b_0	b_1	X_i	$b_1 * X_i$	$(Y_i-b_0-b_1*X_i)^2$
2.02	2.02	-7.40x10-18	0	0	3.27x10-7
2.04	2.02	-7.40x10-18	30	-2.22x10-16	5.01x10-4
1.98	2.02	-7.40x10-18	60	-4.44x10-16	1.23x10-3
1.96	2.02	-7.40x10-18	90	-6.66x10-16	2.92x10-3
2.08	2.02	-7.40x10-18	150	-1.11x10-15	4.52x10-3
				Σ	9.16x10-3
				s	5.53x10-2

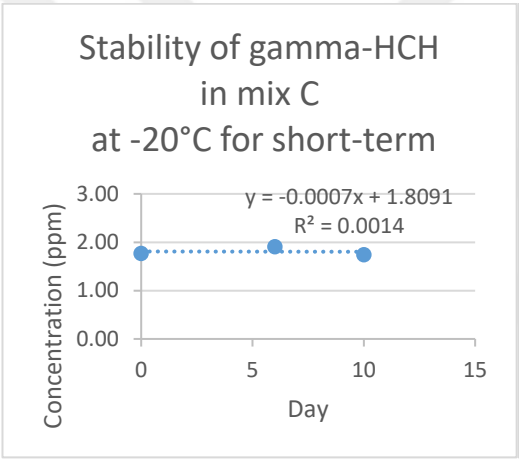
$\Sigma X_i - \bar{X}$	$(\Sigma X_i - \bar{X})^2$	$\sqrt{((\Sigma X_i - \bar{X})^2)}$	s	$s(b_1)$
180	32400	180	5.53x10-2	3.07x10-4

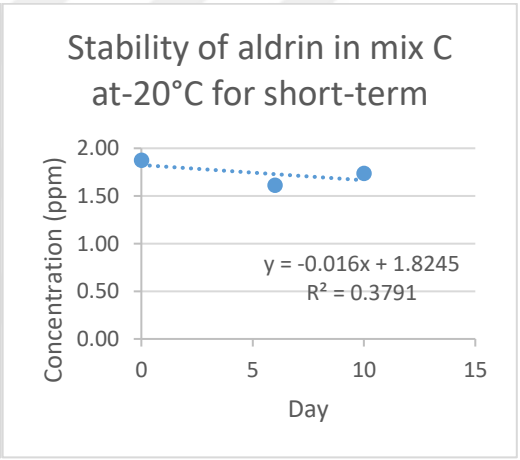
$u_{sts}=t*s(b_1)$	4.60x10-2
%	4.60
tcrit. n-2 at 95 CL	3.18
tcrit. * $s(b_1)$	9.76x10-4
|b1|	3.00x10-4
|b1| < tcrit.*$s(b_1)$	Stable

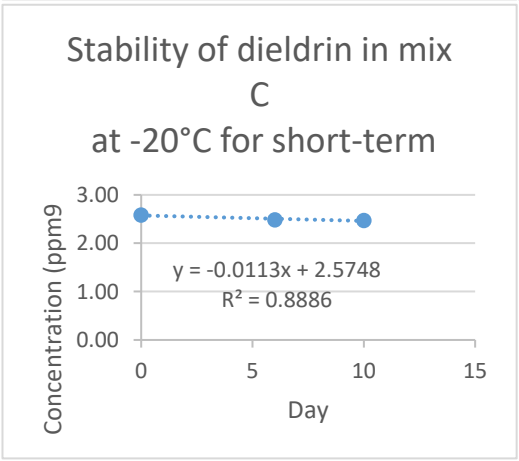
APPENDIX 8 Stability Graphs of Pesticides

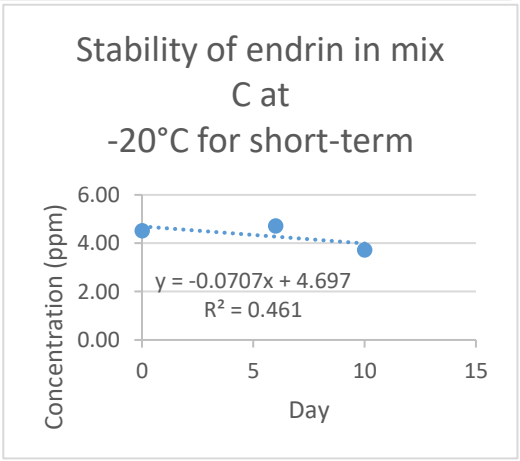












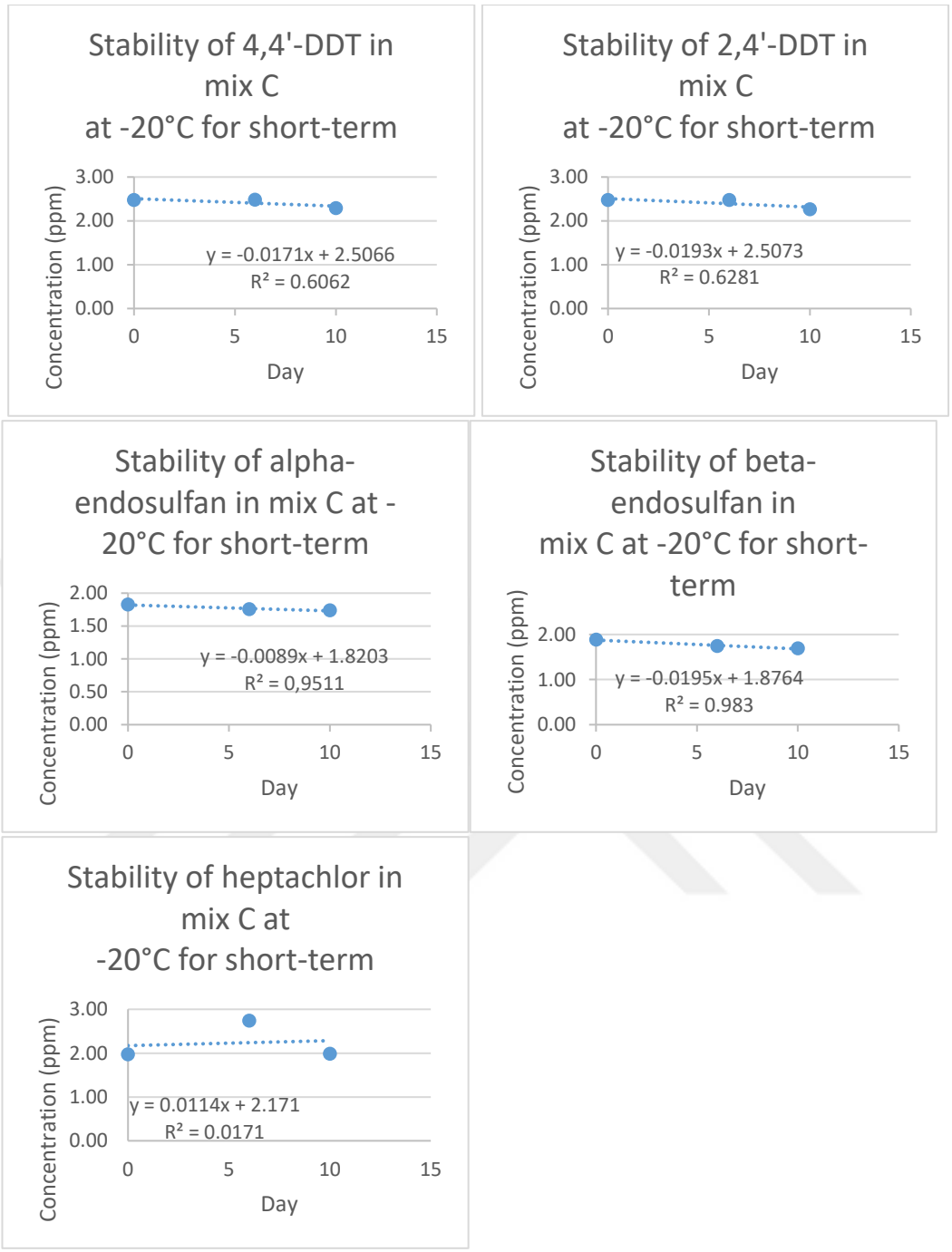
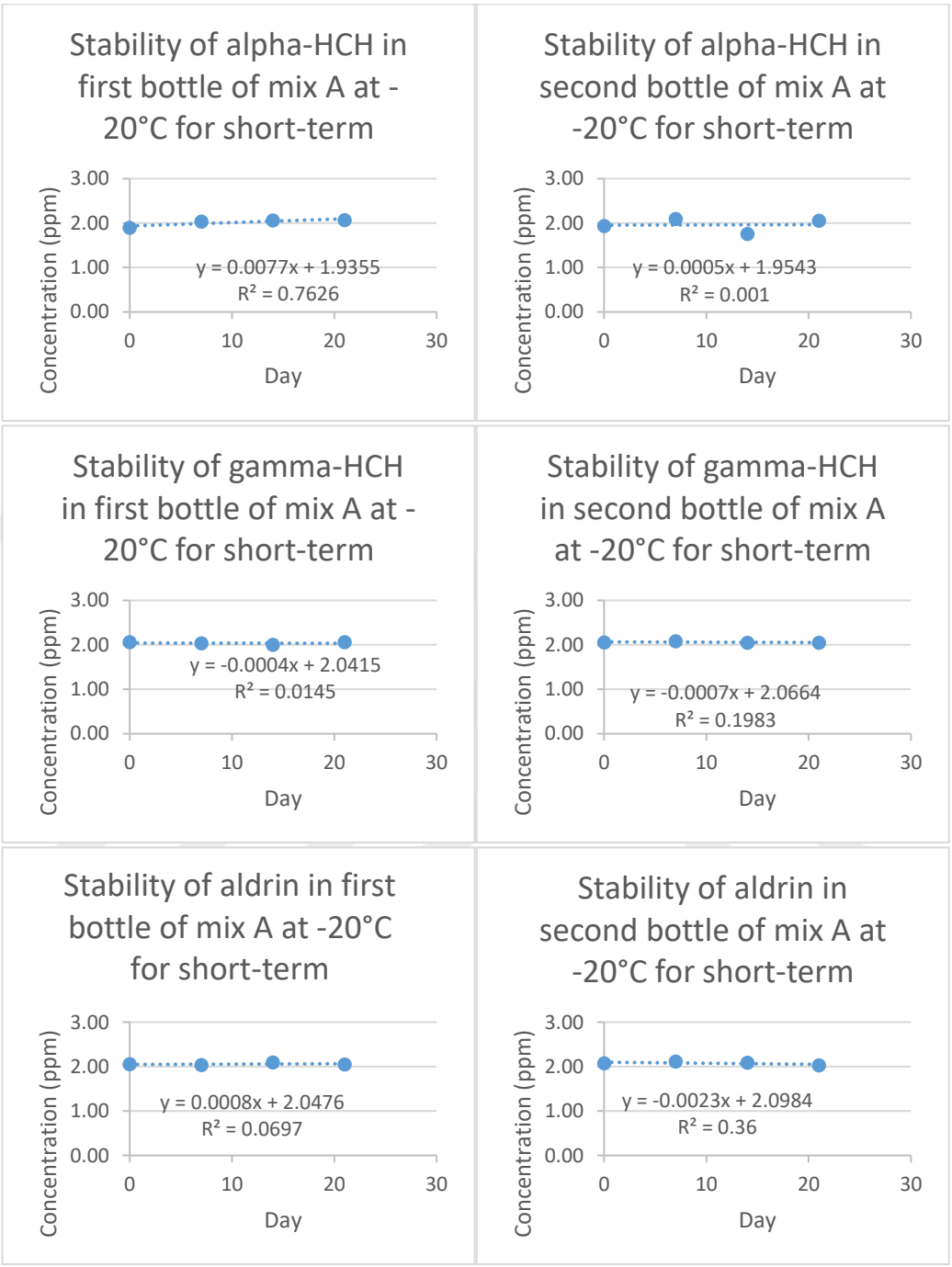
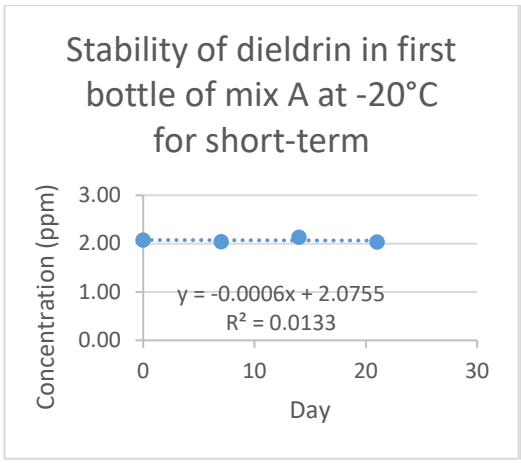
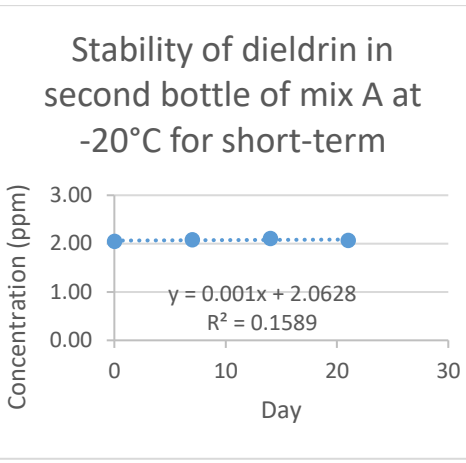
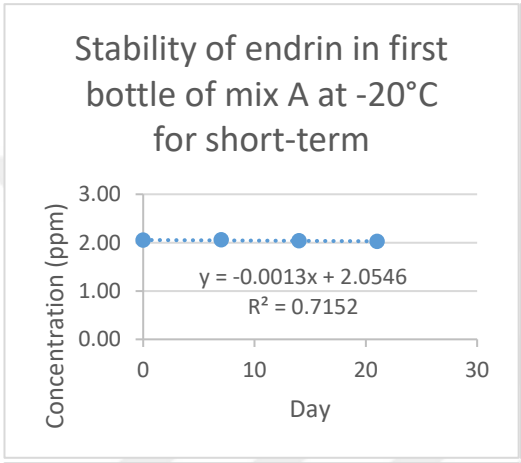


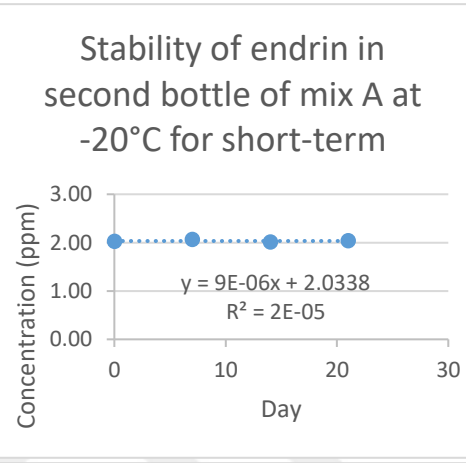
Figure 0.122. The plots of volumetric mix C in short-term stability at -20°C for each pesticide

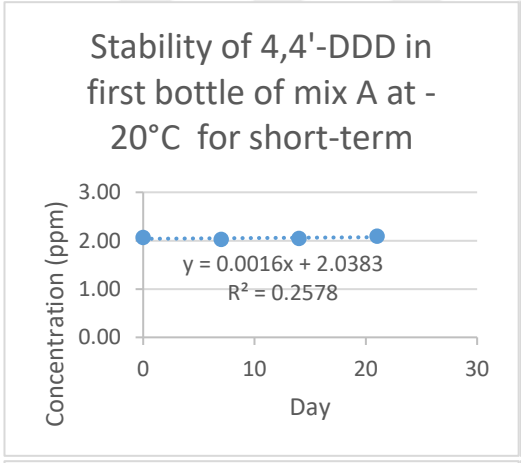

Stability of alpha-HCH in first bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0077x + 1.9355
R² = 0.7626
0
10
20
30
Day
Stability of alpha-HCH in second bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0005x + 1.9543
R² = 0.001
0
10
20
30
Day
Stability of gamma-HCH in first bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0004x + 2.0415
R² = 0.0145
0
10
20
30
Day
Stability of gamma-HCH in second bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0007x + 2.0664
R² = 0.1983
0
10
20
30
Day
Stability of aldrin in first bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0008x + 2.0476
R² = 0.0697
0
10
20
30
Day
Stability of aldrin in second bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0023x + 2.0984
R² = 0.36
0
10
20
30
Day

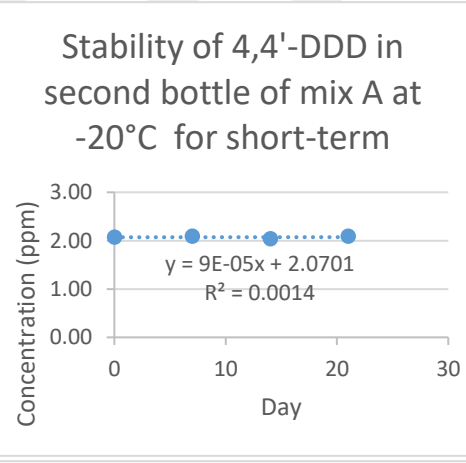

Stability of dieldrin in first bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0006x + 2.0755
R² = 0.0133
0
10
20
30
Day

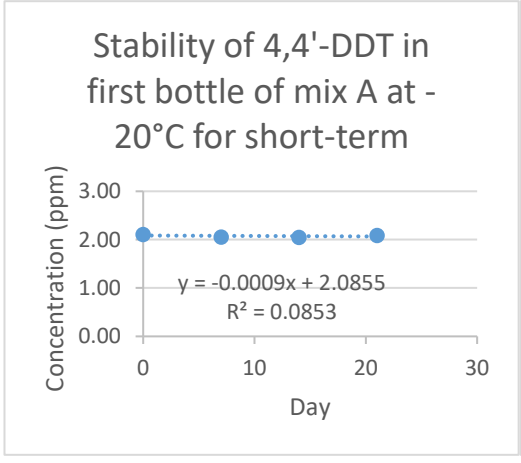

Stability of dieldrin in second bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.001x + 2.0628
R² = 0.1589
0
10
20
30
Day

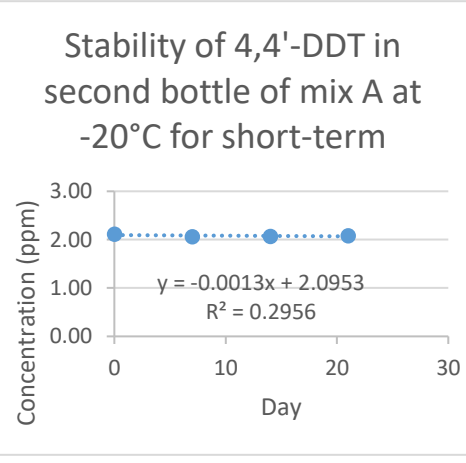

Stability of endrin in first bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0013x + 2.0546
R² = 0.7152
0
10
20
30
Day

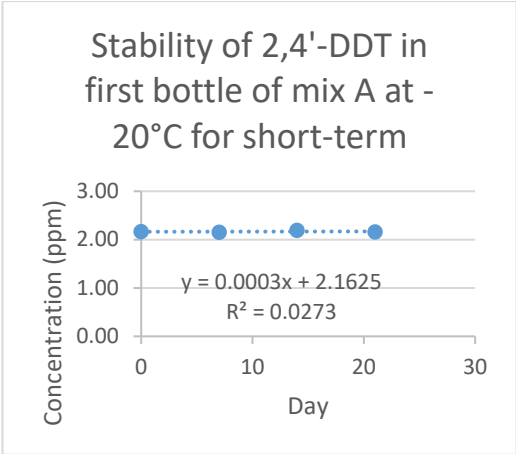

Stability of endrin in second bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 9E-06x + 2.0338
R² = 2E-05
0
10
20
30
Day

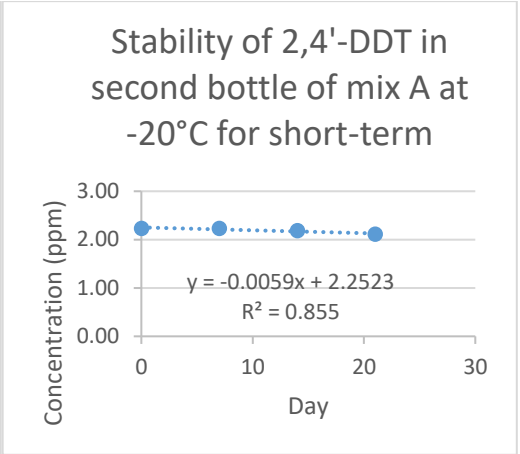

Stability of 4,4'-DDD in first bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0016x + 2.0383
R² = 0.2578
0
10
20
30
Day

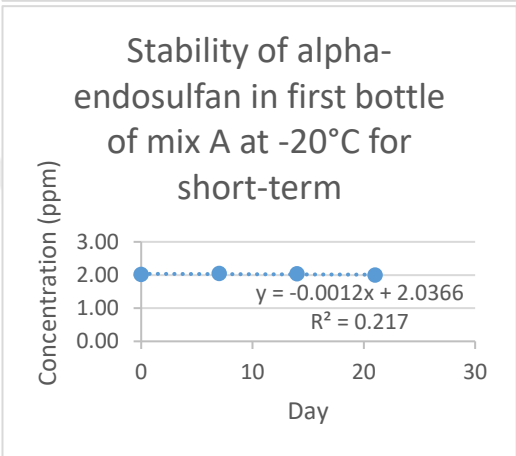

Stability of 4,4'-DDD in second bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 9E-05x + 2.0701
R² = 0.0014
0
10
20
30
Day

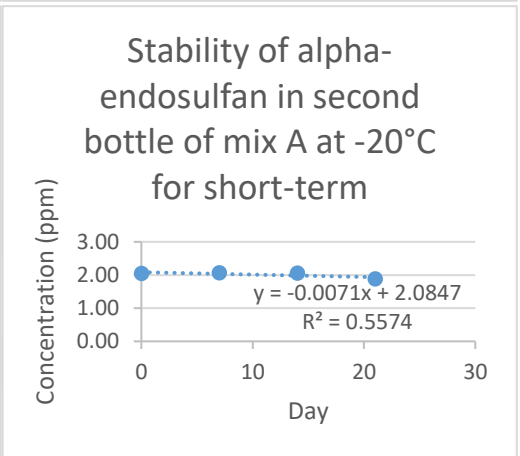

Stability of 4,4'-DDT in first bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0009x + 2.0855
R² = 0.0853
0
10
20
30
Day

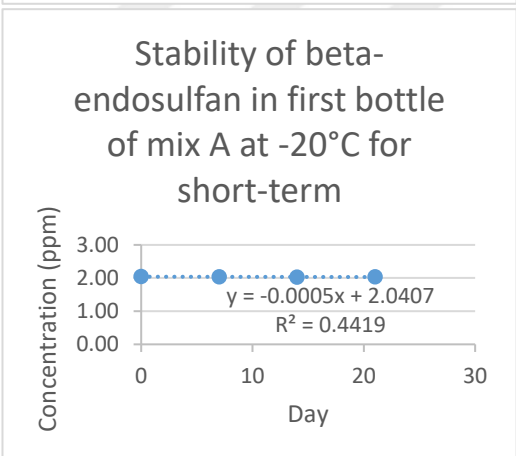

Stability of 4,4'-DDT in second bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0013x + 2.0953
R² = 0.2956
0
10
20
30
Day

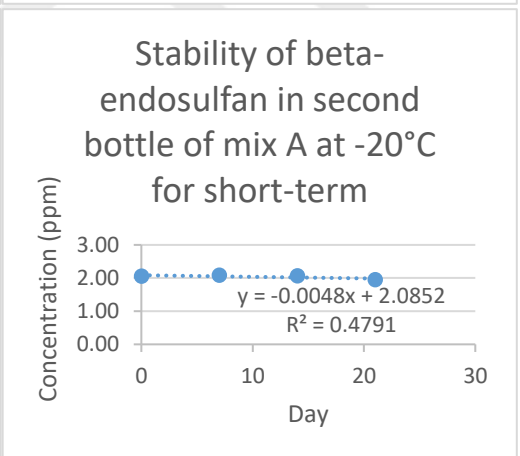

Stability of 2,4'-DDT in first bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0003x + 2.1625
R² = 0.0273
0
10
20
30
Day

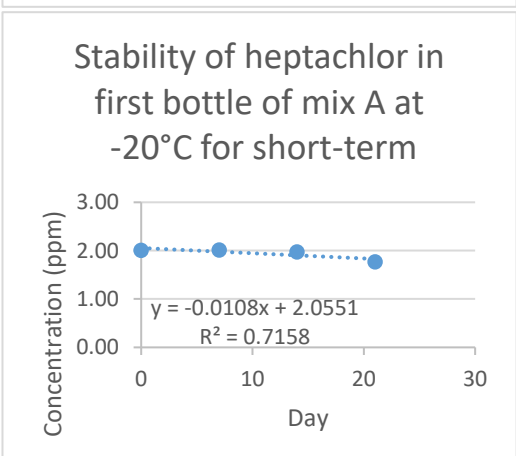

Stability of 2,4'-DDT in second bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0059x + 2.2523
R² = 0.855
0
10
20
30
Day

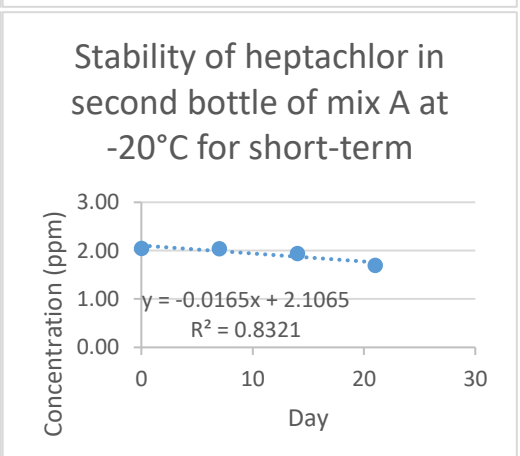

Stability of alpha-endosulfan in first bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0012x + 2.0366
R² = 0.217
0
10
20
30
Day

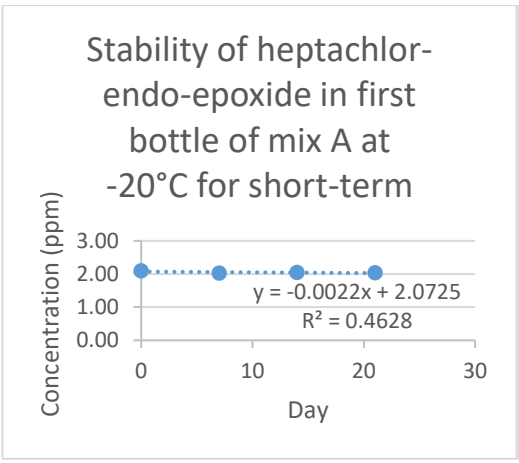

Stability of alpha-endosulfan in second bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0071x + 2.0847
R² = 0.5574
0
10
20
30
Day

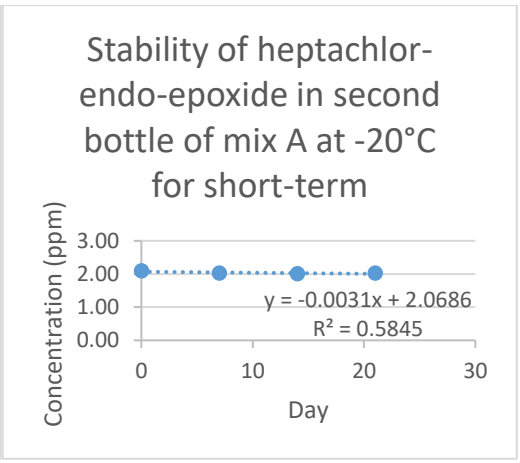

Stability of beta-endosulfan in first bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0005x + 2.0407
R² = 0.4419
0
10
20
30
Day

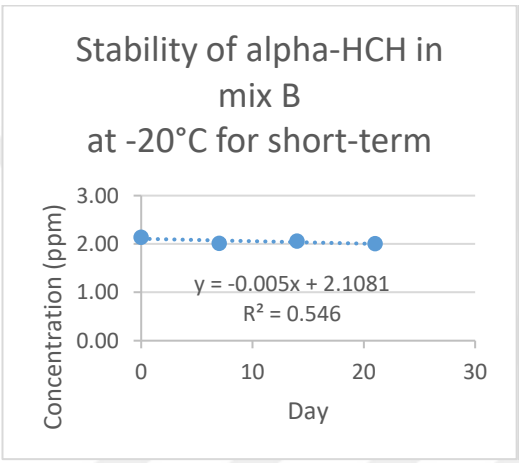

Stability of beta-endosulfan in second bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0048x + 2.0852
R² = 0.4791
0
10
20
30
Day

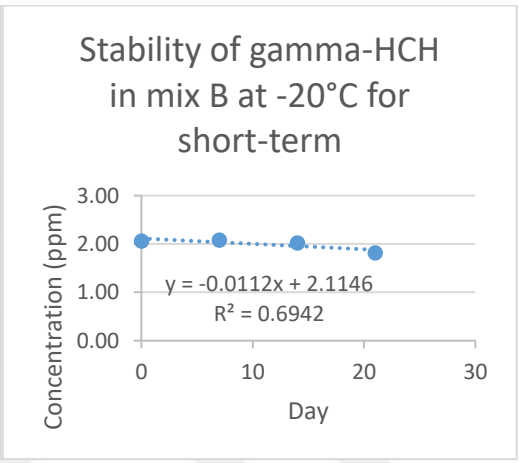

Stability of heptachlor in first bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0108x + 2.0551
R² = 0.7158
0
10
20
30
Day

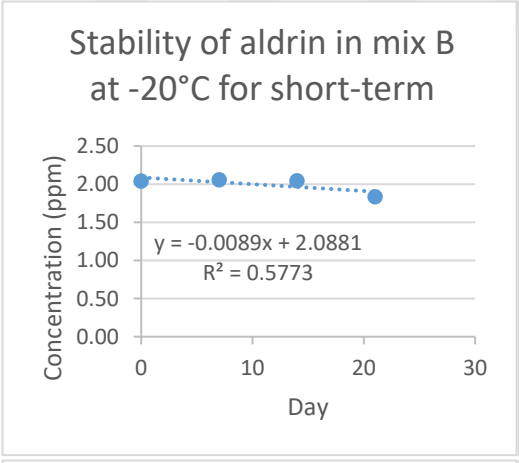

Stability of heptachlor in second bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0165x + 2.1065
R² = 0.8321
0
10
20
30
Day

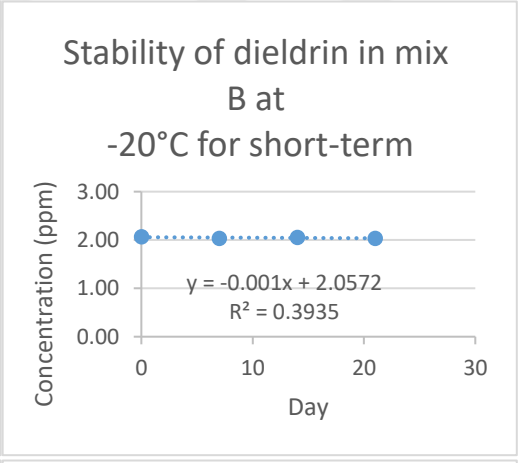

Stability of heptachlor-endo-epoxide in first bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0022x + 2.0725
R² = 0.4628
0
10
20
30
Day

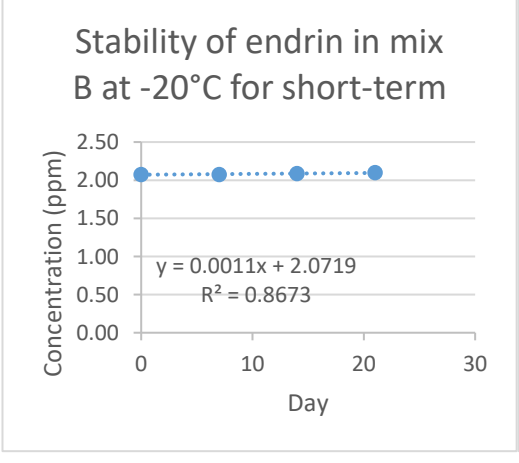

Stability of heptachlor-endo-epoxide in second bottle of mix A at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0031x + 2.0686
R² = 0.5845
0
10
20
30
Day

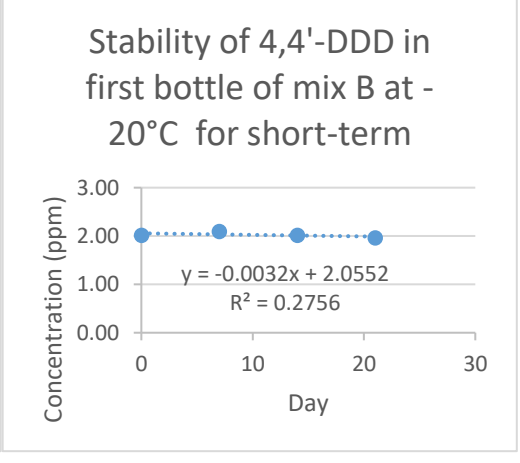

Stability of alpha-HCH in mix B at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.005x + 2.1081
R² = 0.546
0
10
20
30
Day

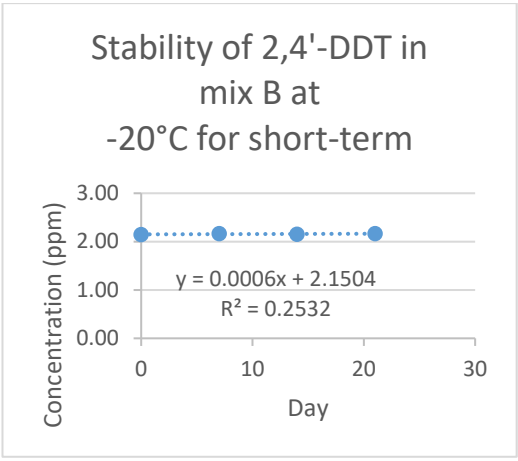

Stability of gamma-HCH in mix B at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0112x + 2.1146
R² = 0.6942
0
10
20
30
Day

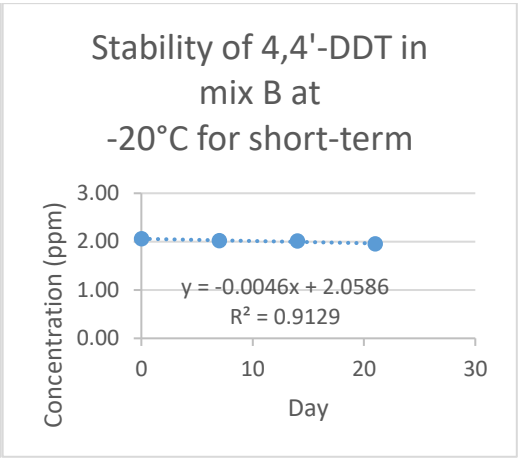

Stability of aldrin in mix B at -20°C for short-term
Concentration (ppm)
2.50
2.00
1.50
1.00
0.50
0.00
y = -0.0089x + 2.0881
R² = 0.5773
0
10
20
30
Day

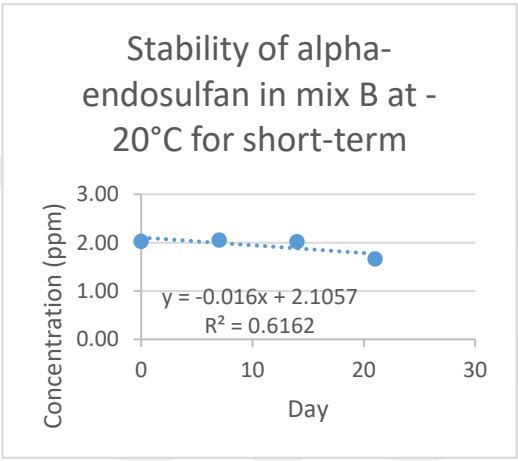

Stability of dieldrin in mix B at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.001x + 2.0572
R² = 0.3935
0
10
20
30
Day

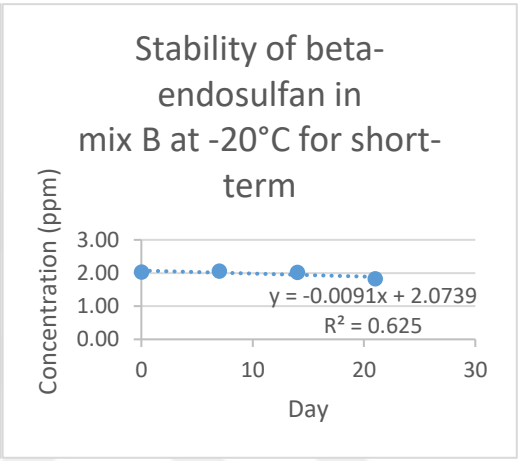

Stability of endrin in mix B at -20°C for short-term
Concentration (ppm)
2.50
2.00
1.50
1.00
0.50
0.00
y = 0.0011x + 2.0719
R² = 0.8673
0
10
20
30
Day

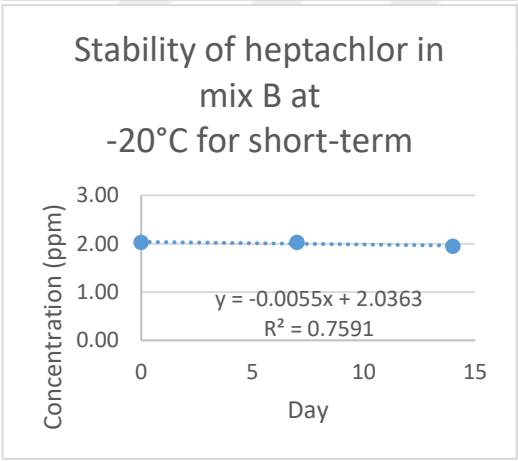

Stability of 4,4'-DDD in first bottle of mix B at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0032x + 2.0552
R² = 0.2756
0
10
20
30
Day

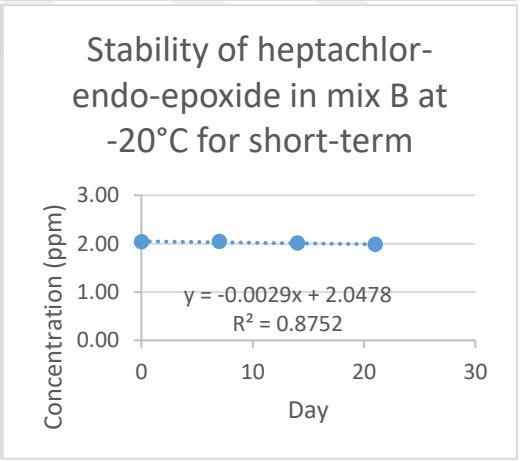

Stability of 2,4'-DDT in mix B at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0006x + 2.1504
R² = 0.2532
0
10
20
30
Day

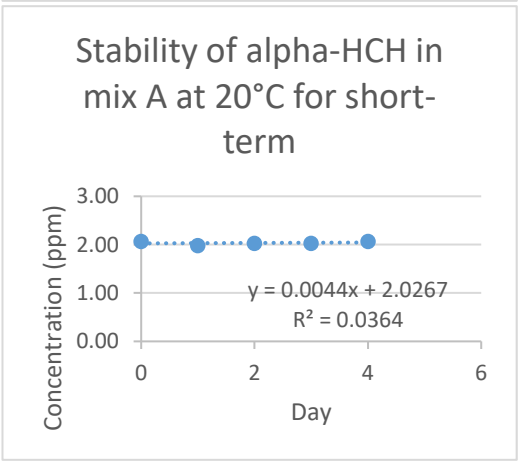

Stability of 4,4'-DDT in mix B at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0046x + 2.0586
R² = 0.9129
0
10
20
30
Day

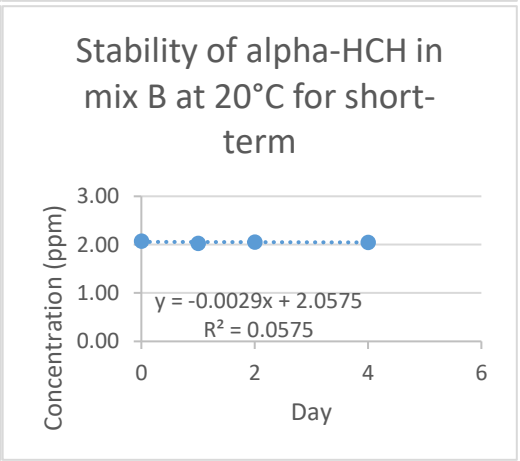

Stability of alpha-endosulfan in mix B at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.016x + 2.1057
R² = 0.6162
0
10
20
30
Day

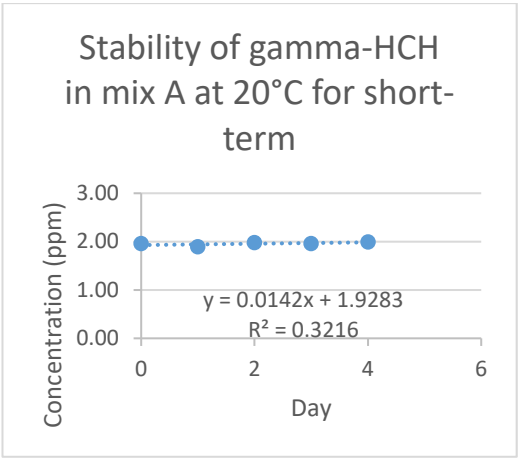

Stability of beta-endosulfan in mix B at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0091x + 2.0739
R² = 0.625
0
10
20
30
Day

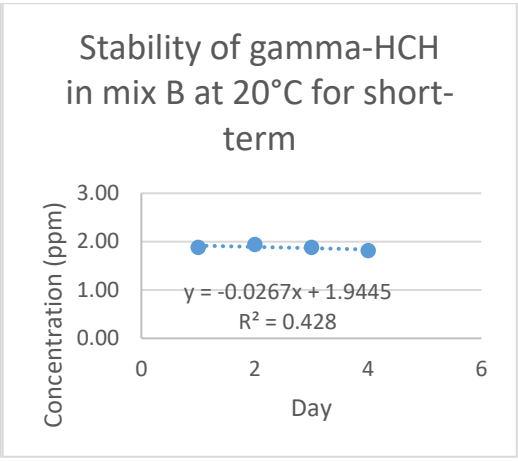

Stability of heptachlor in mix B at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0055x + 2.0363
R² = 0.7591
0
5
10
15
Day

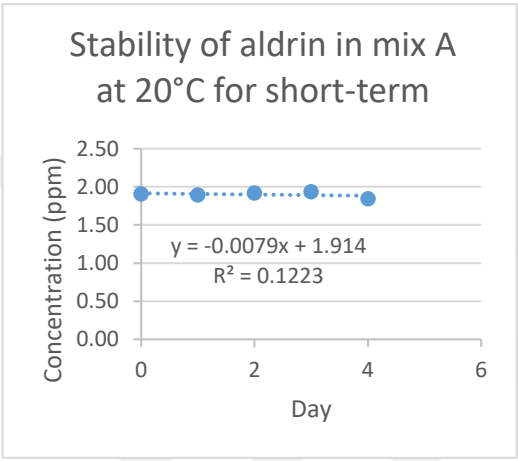

Stability of heptachlor-endo-epoxide in mix B at -20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0029x + 2.0478
R² = 0.8752
0
10
20
30
Day

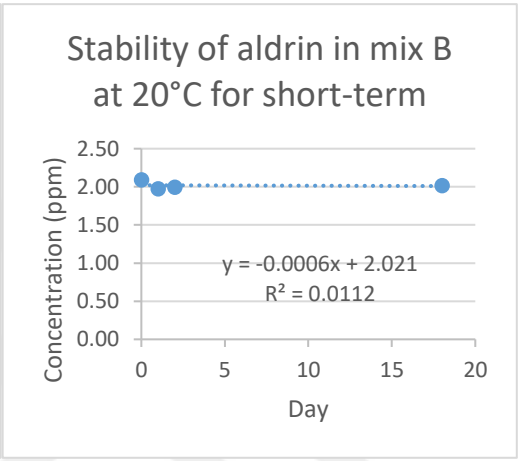

Stability of alpha-HCH in mix A at 20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0044x + 2.0267
R² = 0.0364
0
2
4
6
Day

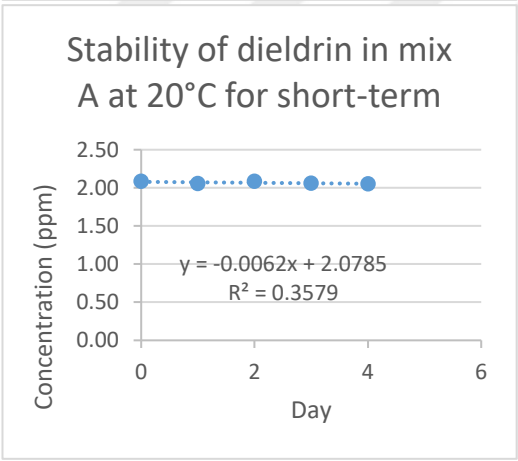

Stability of alpha-HCH in mix B at 20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0029x + 2.0575
R² = 0.0575
0
2
4
6
Day

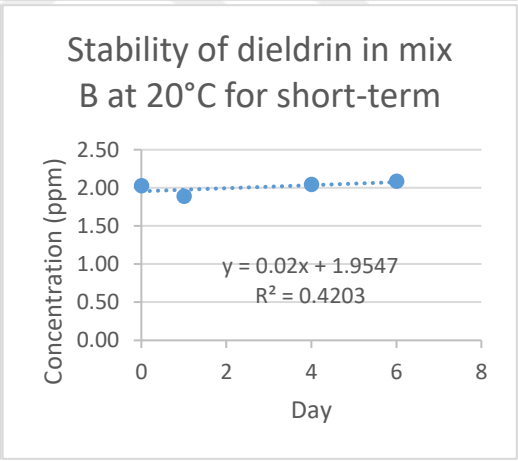

Stability of gamma-HCH in mix A at 20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0142x + 1.9283
R² = 0.3216
0
2
4
6
Day

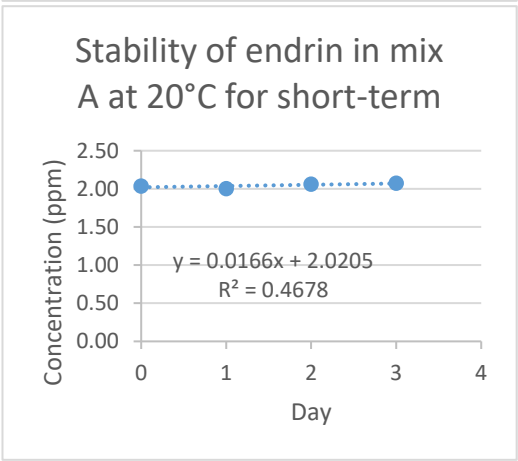

Stability of gamma-HCH in mix B at 20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0267x + 1.9445
R² = 0.428
0
2
4
6
Day

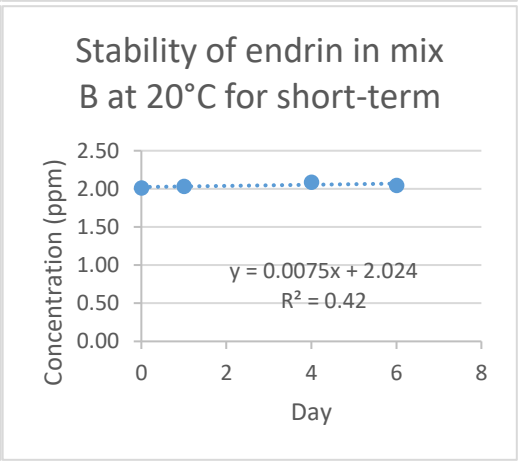

Stability of aldrin in mix A at 20°C for short-term
Concentration (ppm)
2.50
2.00
1.50
1.00
0.50
0.00
y = -0.0079x + 1.914
R² = 0.1223
0
2
4
6
Day

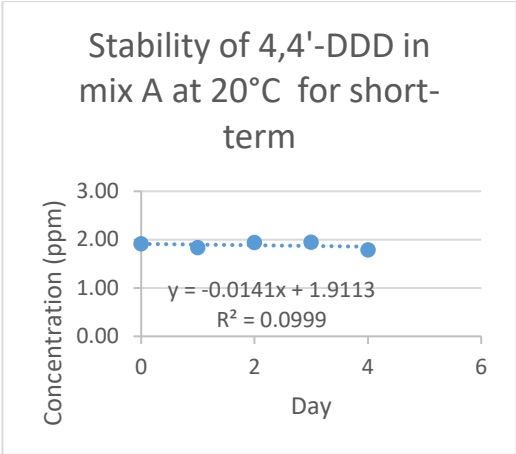

Stability of aldrin in mix B at 20°C for short-term
Concentration (ppm)
2.50
2.00
1.50
1.00
0.50
0.00
y = -0.0006x + 2.021
R² = 0.0112
0
5
10
15
20
Day

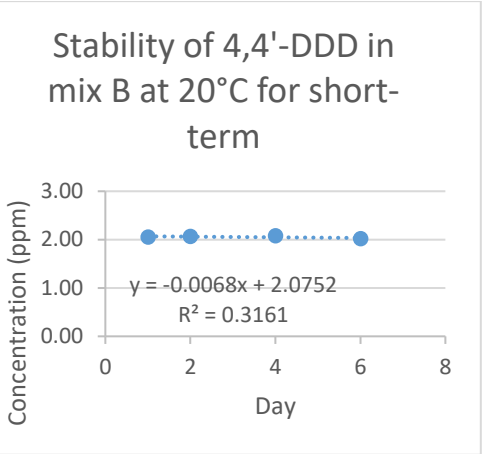

Stability of dieldrin in mix A at 20°C for short-term
Concentration (ppm)
2.50
2.00
1.50
1.00
0.50
0.00
y = -0.0062x + 2.0785
R² = 0.3579
0
2
4
6
Day

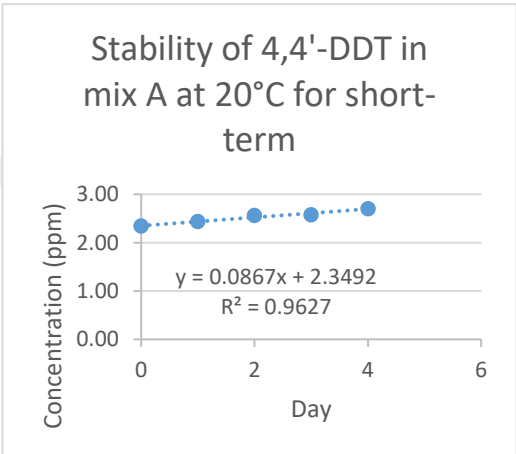

Stability of dieldrin in mix B at 20°C for short-term
Concentration (ppm)
2.50
2.00
1.50
1.00
0.50
0.00
y = 0.02x + 1.9547
R² = 0.4203
0
2
4
6
8
Day

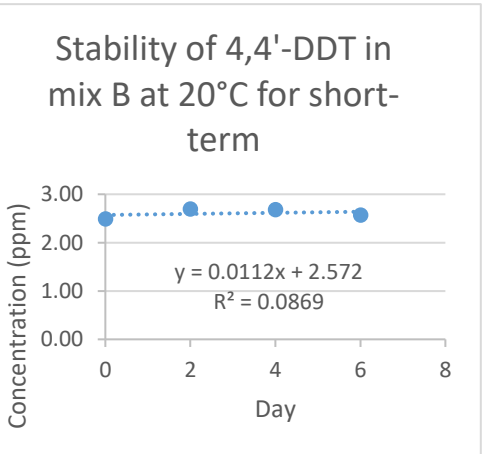

Stability of endrin in mix A at 20°C for short-term
Concentration (ppm)
2.50
2.00
1.50
1.00
0.50
0.00
y = 0.0166x + 2.0205
R² = 0.4678
0
1
2
3
4
Day

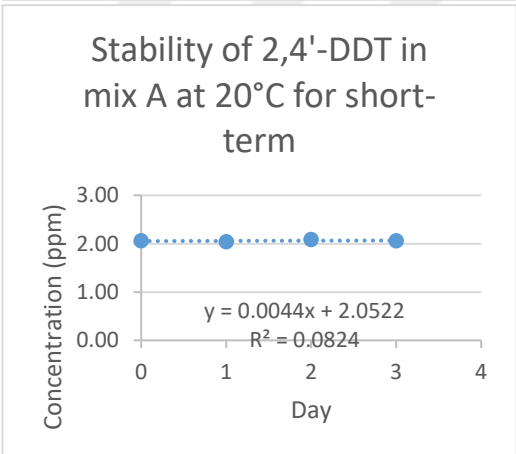

Stability of endrin in mix B at 20°C for short-term
Concentration (ppm)
2.50
2.00
1.50
1.00
0.50
0.00
y = 0.0075x + 2.024
R² = 0.42
0
2
4
6
8
Day

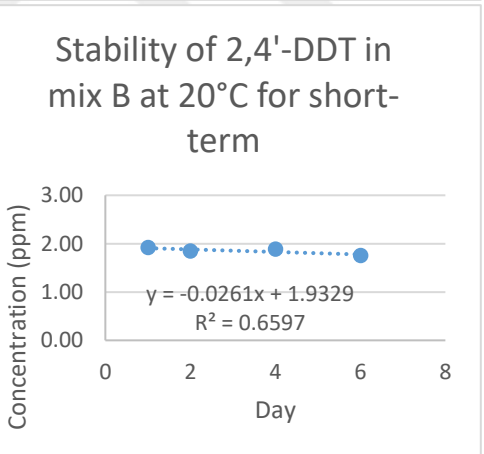

Stability of 4,4'-DDD in mix A at 20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0141x + 1.9113
R² = 0.0999
0
2
4
6
Day

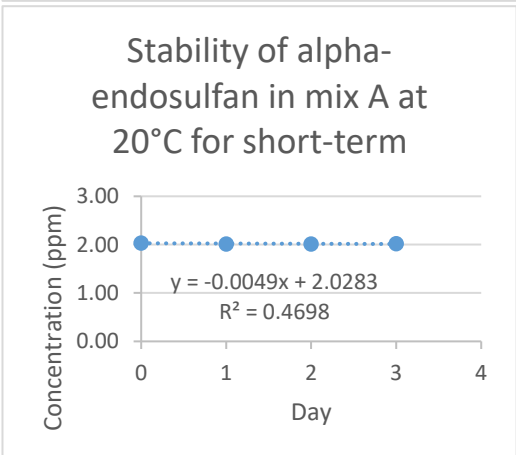

Stability of 4,4'-DDD in mix B at 20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0068x + 2.0752
R² = 0.3161
0
2
4
6
8
Day

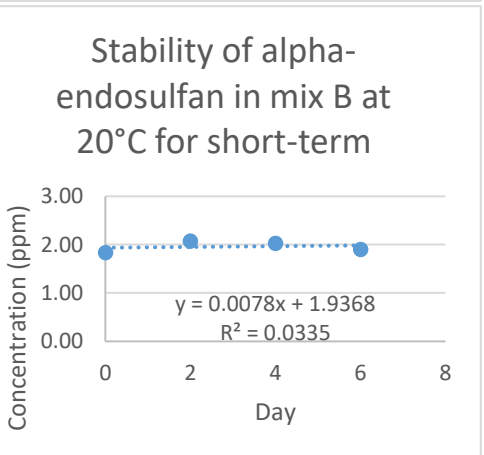

Stability of 4,4'-DDT in mix A at 20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0867x + 2.3492
R² = 0.9627
0
2
4
6
Day


Stability of 4,4'-DDT in mix B at 20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0112x + 2.572
R² = 0.0869
0
2
4
6
8
Day


Stability of 2,4'-DDT in mix A at 20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0044x + 2.0522
R² = 0.0824
0
1
2
3
4
Day


Stability of 2,4'-DDT in mix B at 20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0261x + 1.9329
R² = 0.6597
0
2
4
6
8
Day


Stability of alpha-endosulfan in mix A at 20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0049x + 2.0283
R² = 0.4698
0
1
2
3
4
Day


Stability of alpha-endosulfan in mix B at 20°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0078x + 1.9368
R² = 0.0335
0
2
4
6
8
Day

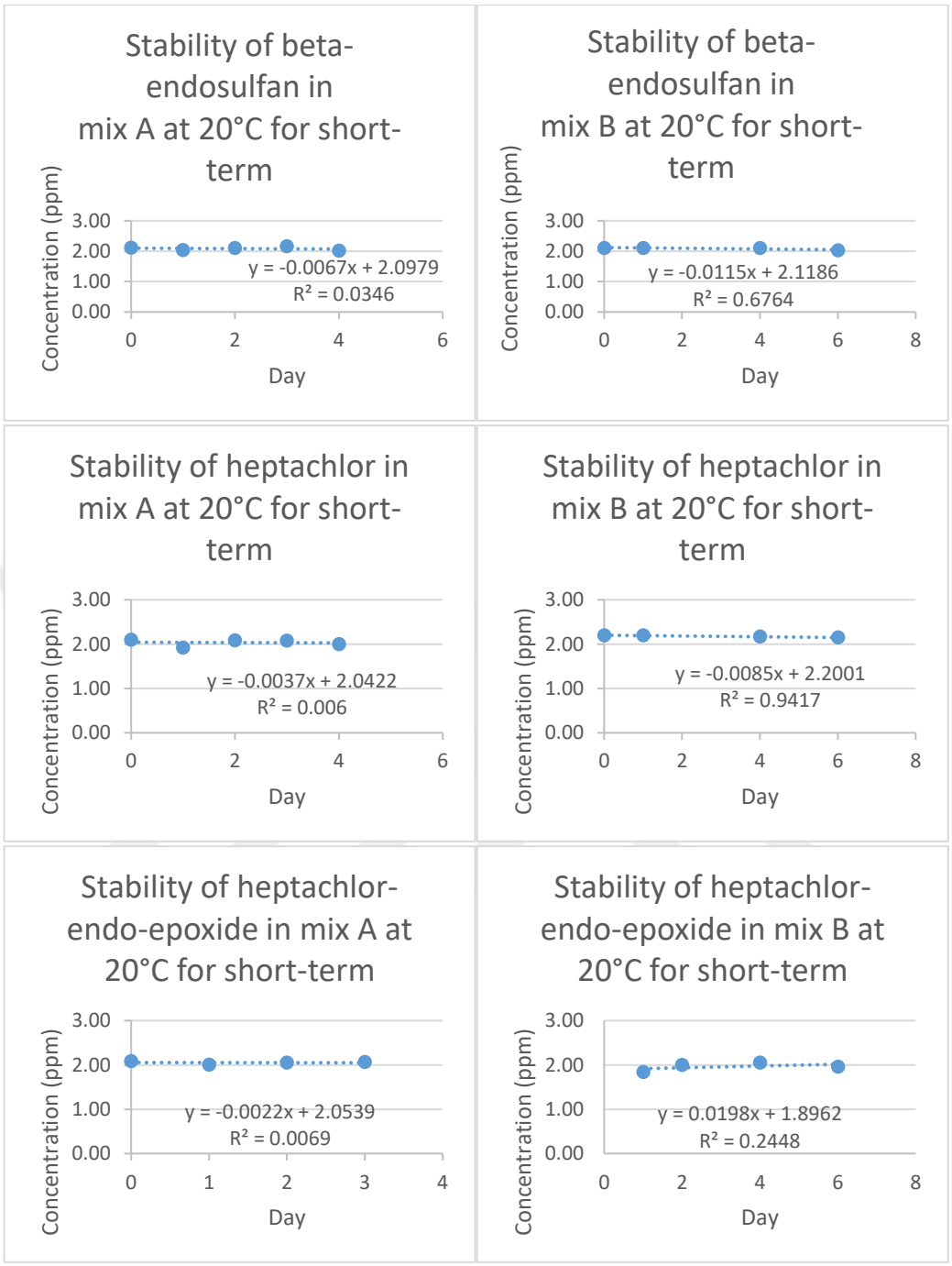
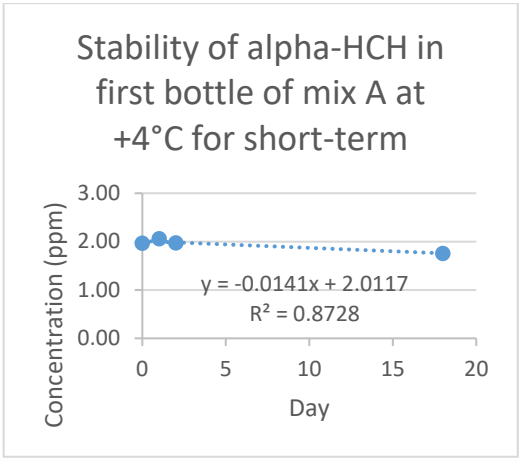
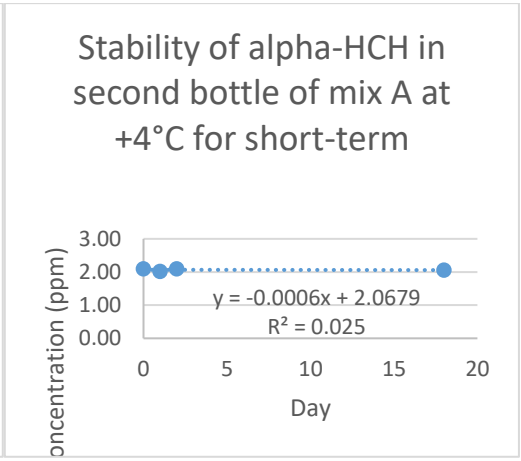
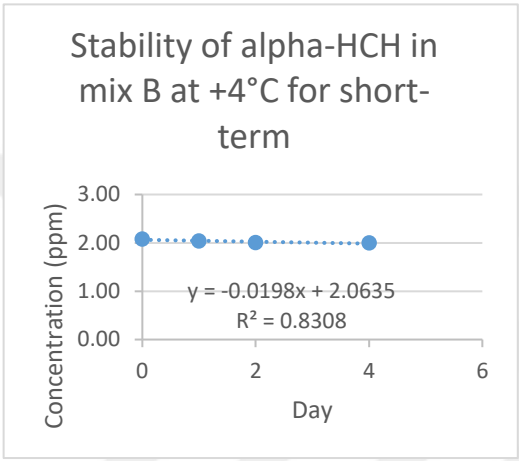
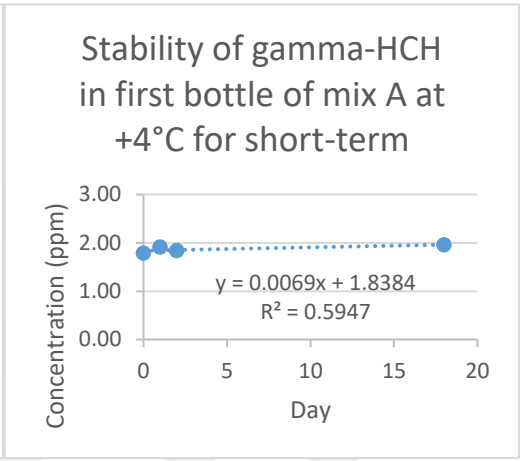


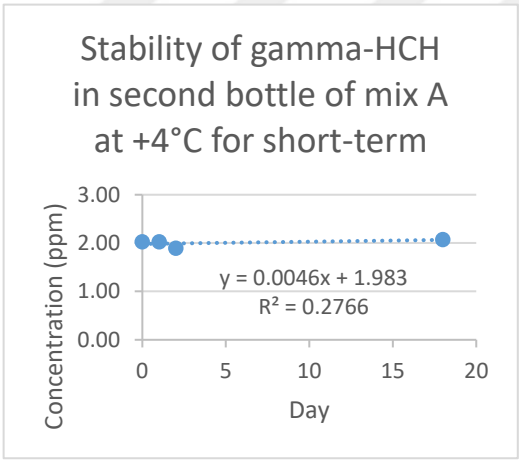
Figure 0.123. The plots of gravimetric mixtures (A and B) in short term stability at -20°C and 20°C for each pesticide

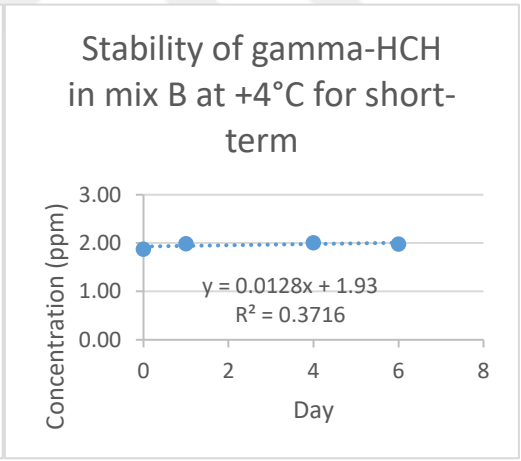

Stability of alpha-HCH in first bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0141x + 2.0117
R² = 0.8728
0
5
10
15
20
Day

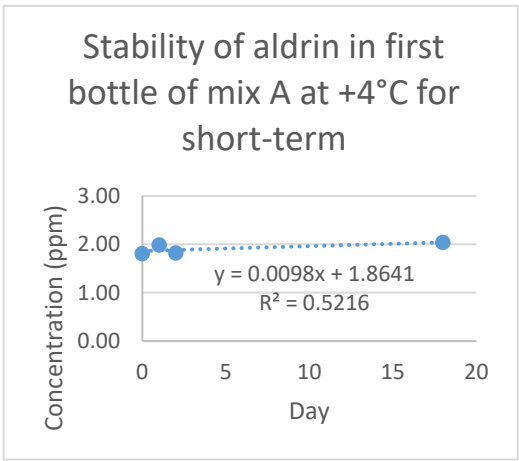

Stability of alpha-HCH in second bottle of mix A at +4°C for short-term
oncentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0006x + 2.0679
R² = 0.025
0
5
10
15
20
Day

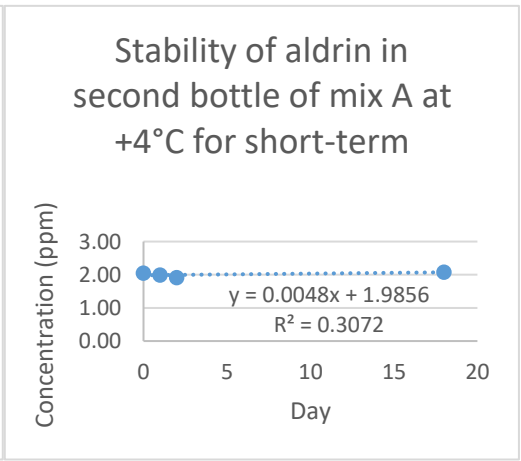

Stability of alpha-HCH in mix B at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0198x + 2.0635
R² = 0.8308
0
2
4
6
Day

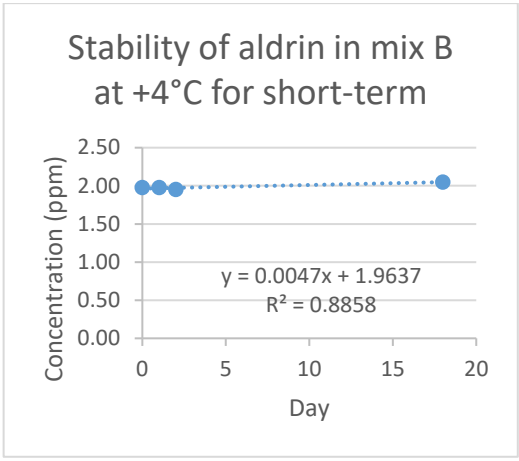

Stability of gamma-HCH in first bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0069x + 1.8384
R² = 0.5947
0
5
10
15
20
Day

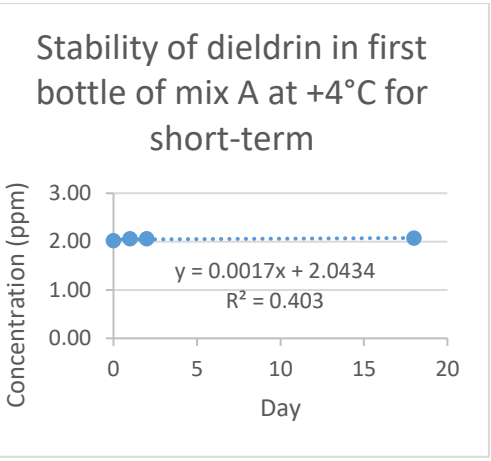

Stability of gamma-HCH in second bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0046x + 1.983
R² = 0.2766
0
5
10
15
20
Day

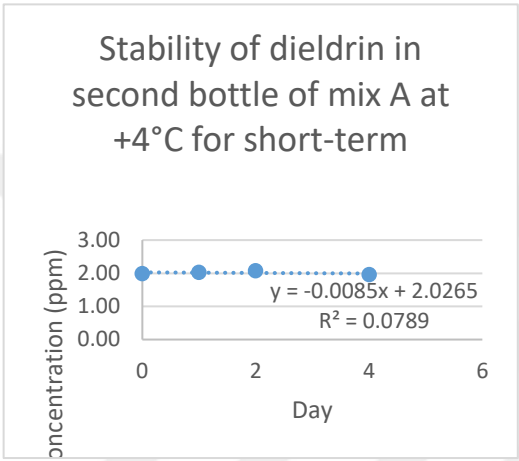

Stability of gamma-HCH in mix B at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0128x + 1.93
R² = 0.3716
0
2
4
6
8
Day

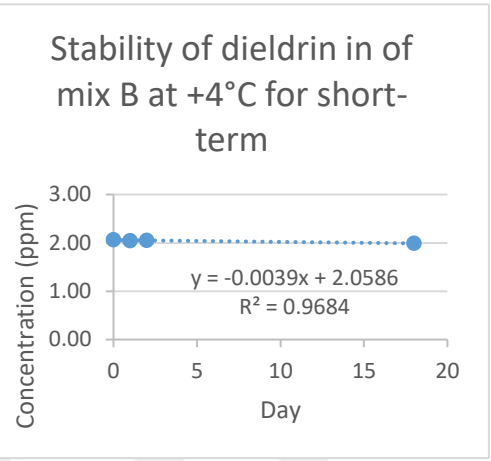

Stability of aldrin in first bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0098x + 1.8641
R² = 0.5216
0
5
10
15
20
Day

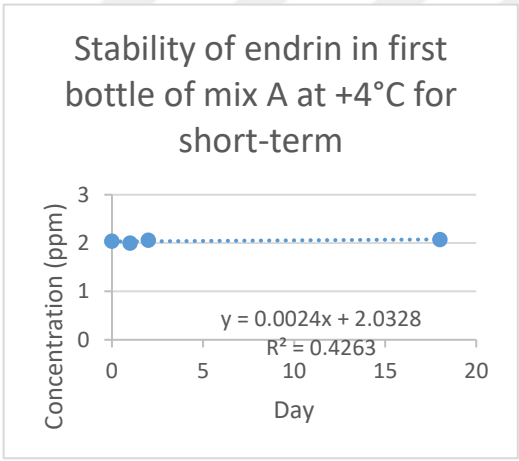

Stability of aldrin in second bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0048x + 1.9856
R² = 0.3072
0
5
10
15
20
Day

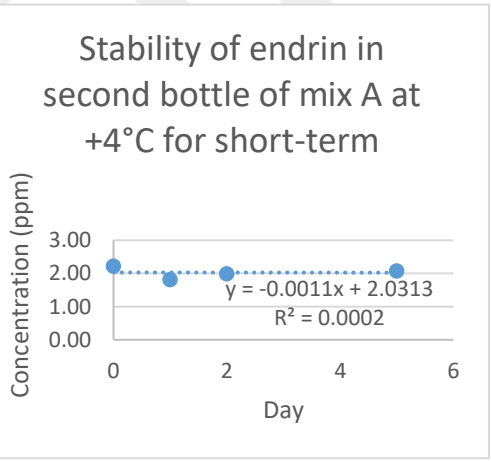

Stability of aldrin in mix B at +4°C for short-term
Concentration (ppm)
2.50
2.00
1.50
1.00
0.50
0.00
y = 0.0047x + 1.9637
R² = 0.8858
0
5
10
15
20
Day

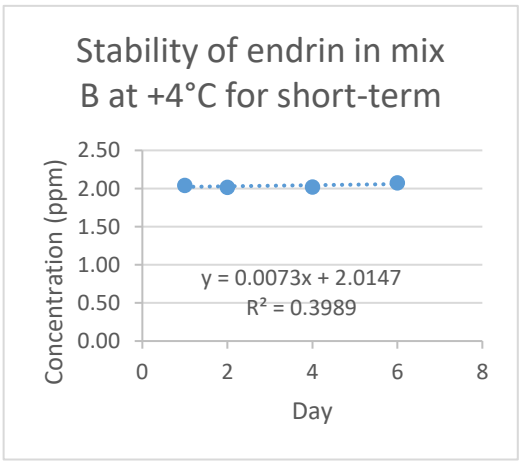

Stability of dieldrin in first bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0017x + 2.0434
R² = 0.403
0
5
10
15
20
Day

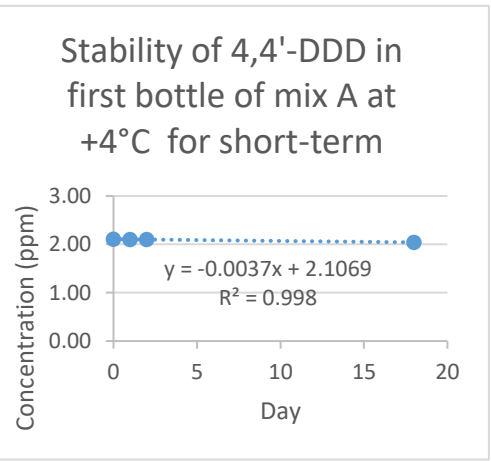

Stability of dieldrin in second bottle of mix A at +4°C for short-term
3.00
2.00
1.00
0.00
y = -0.0085x + 2.0265
R² = 0.0789
0
2
4
6
Day

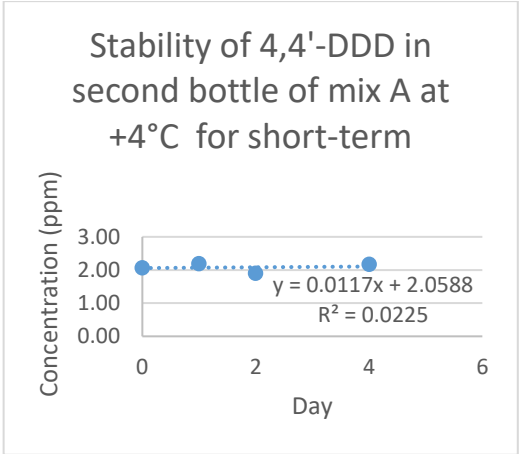

Stability of dieldrin in of mix B at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0039x + 2.0586
R² = 0.9684
0
5
10
15
20
Day

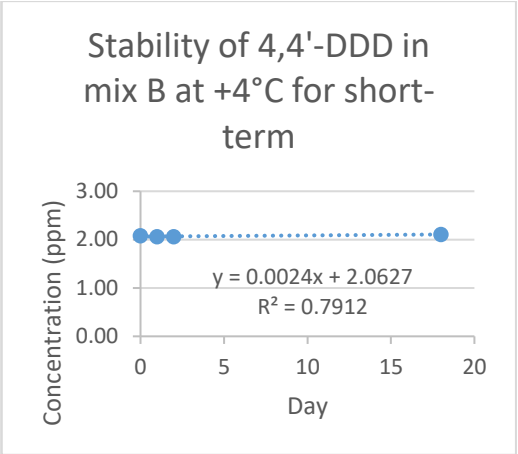

Stability of endrin in first bottle of mix A at +4°C for short-term
Concentration (ppm)
3
2
1
0
y = 0.0024x + 2.0328
R² = 0.4263
0
5
10
15
20
Day

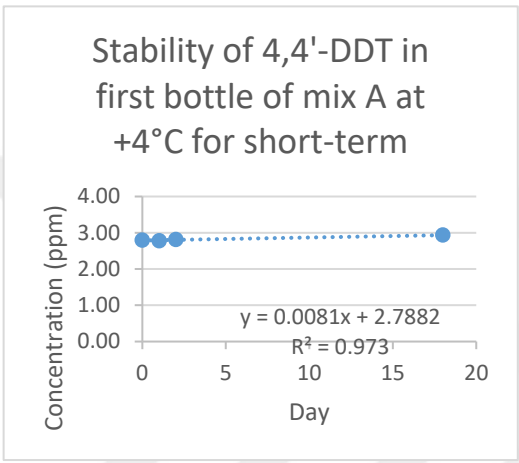

Stability of endrin in second bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0011x + 2.0313
R² = 0.0002
0
2
4
6
Day

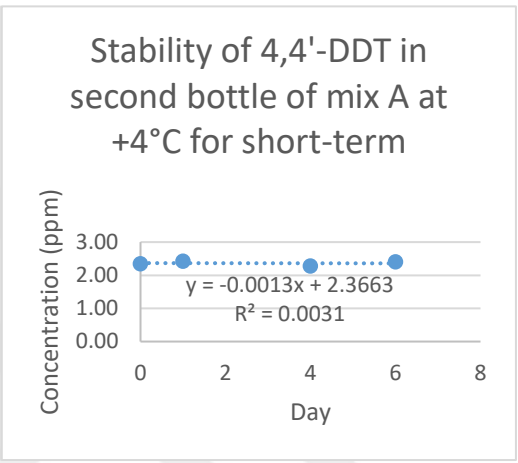

Stability of endrin in mix B at +4°C for short-term
Concentration (ppm)
2.50
2.00
1.50
1.00
0.50
0.00
y = 0.0073x + 2.0147
R² = 0.3989
0
2
4
6
8
Day

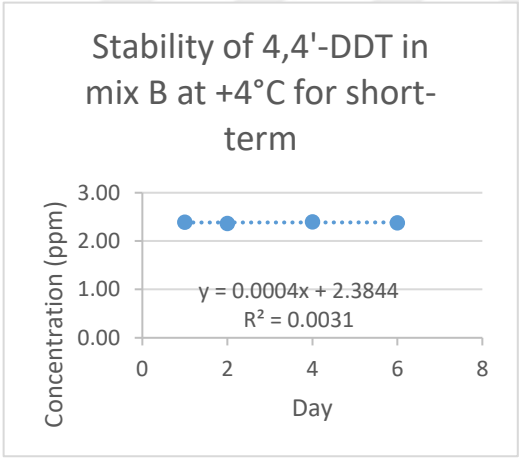

Stability of 4,4'-DDD in first bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0037x + 2.1069
R² = 0.998
0
5
10
15
20
Day

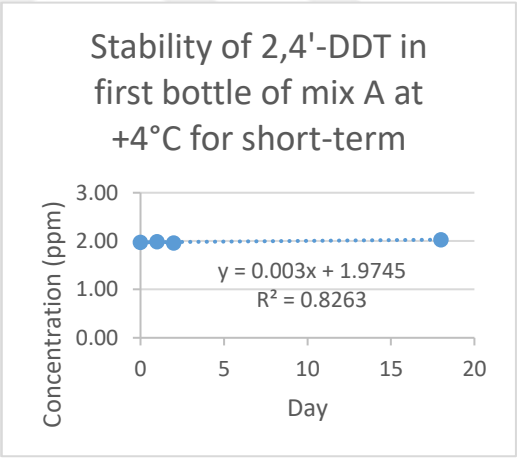

Stability of 4,4'-DDD in second bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0117x + 2.0588
R² = 0.0225
0
2
4
6
Day

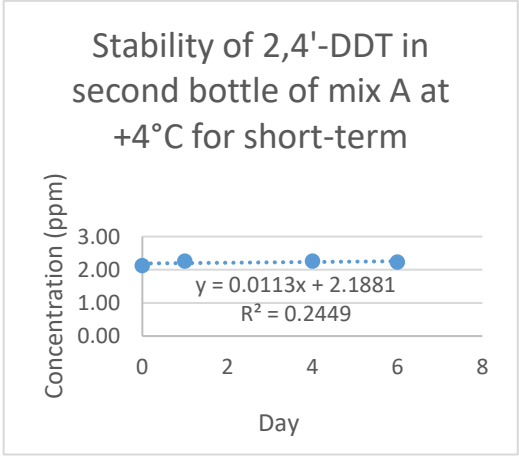

Stability of 4,4'-DDD in mix B at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0024x + 2.0627
R² = 0.7912
0
5
10
15
20
Day

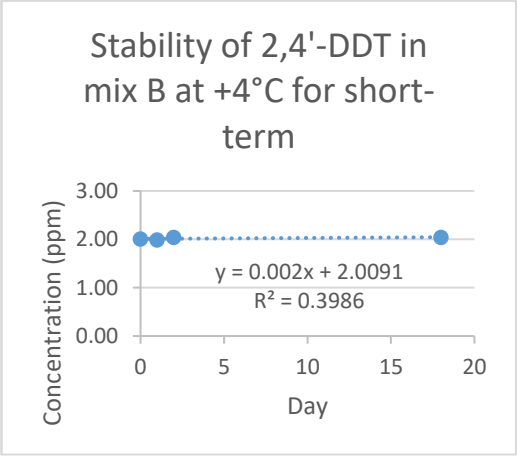

Stability of 4,4'-DDT in first bottle of mix A at +4°C for short-term
Concentration (ppm)
4.00
3.00
2.00
1.00
0.00
y = 0.0081x + 2.7882
R² = 0.973
0
5
10
15
20
Day

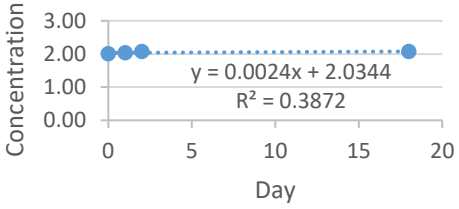

Stability of 4,4'-DDT in second bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0013x + 2.3663
R² = 0.0031
0
2
4
6
8
Day

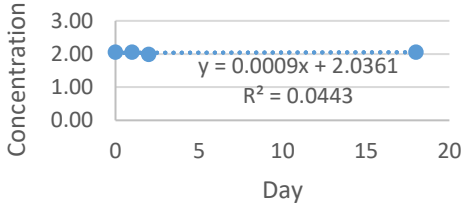

Stability of 4,4'-DDT in mix B at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0004x + 2.3844
R² = 0.0031
0
2
4
6
8
Day

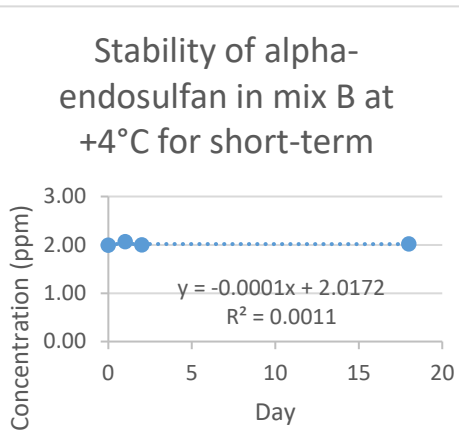

Stability of 2,4'-DDT in first bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.003x + 1.9745
R² = 0.8263
0
5
10
15
20
Day

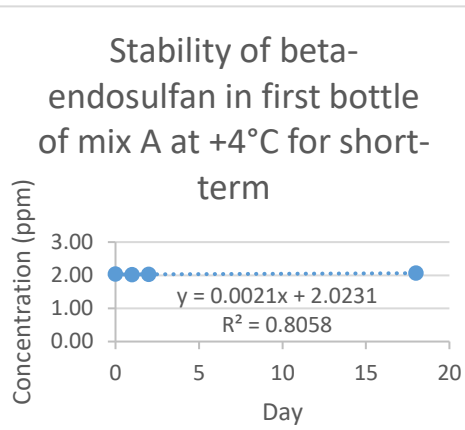

Stability of 2,4'-DDT in second bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0113x + 2.1881
R² = 0.2449
0
2
4
6
8
Day

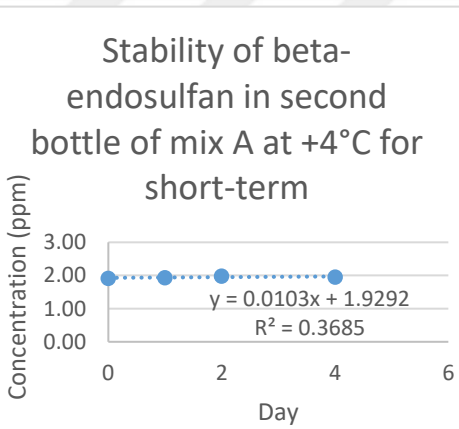

Stability of 2,4'-DDT in mix B at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.002x + 2.0091
R² = 0.3986
0
5
10
15
20
Day

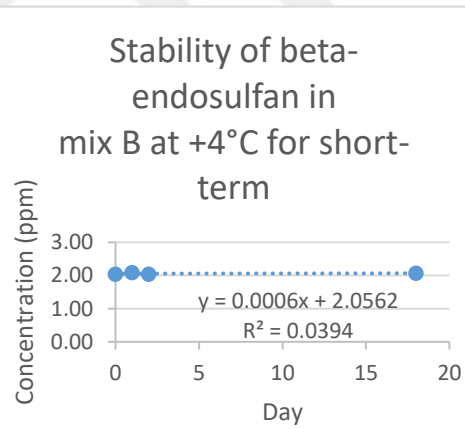

Stability of alpha-endosulfan in first bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0024x + 2.0344
R² = 0.3872
0
5
10
15
20
Day

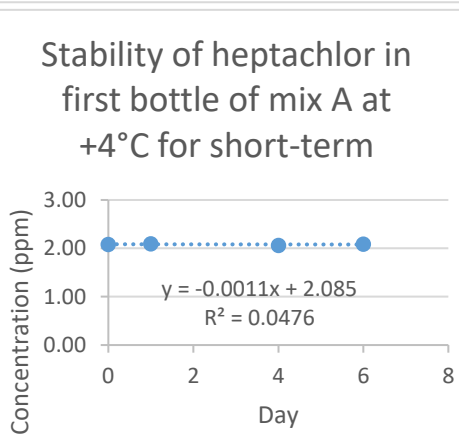

Stability of alpha-endosulfan in second bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0009x + 2.0361
R² = 0.0443
0
5
10
15
20
Day

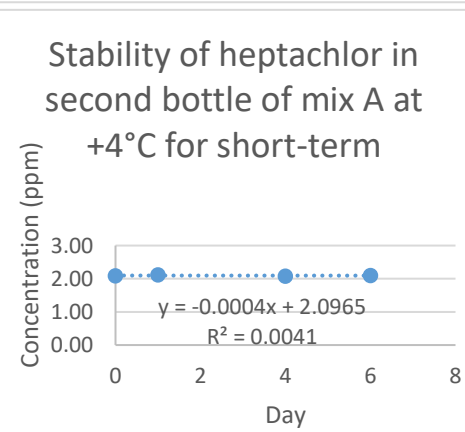

Stability of alpha-endosulfan in mix B at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0001x + 2.0172
R² = 0.0011
0
5
10
15
20
Day


Stability of beta-endosulfan in first bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0021x + 2.0231
R² = 0.8058
0
5
10
15
20
Day


Stability of beta-endosulfan in second bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0103x + 1.9292
R² = 0.3685
0
2
4
6
Day


Stability of beta-endosulfan in mix B at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0006x + 2.0562
R² = 0.0394
0
5
10
15
20
Day


Stability of heptachlor in first bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0011x + 2.085
R² = 0.0476
0
2
4
6
8
Day


Stability of heptachlor in second bottle of mix A at +4°C for short-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0004x + 2.0965
R² = 0.0041
0
2
4
6
8
Day

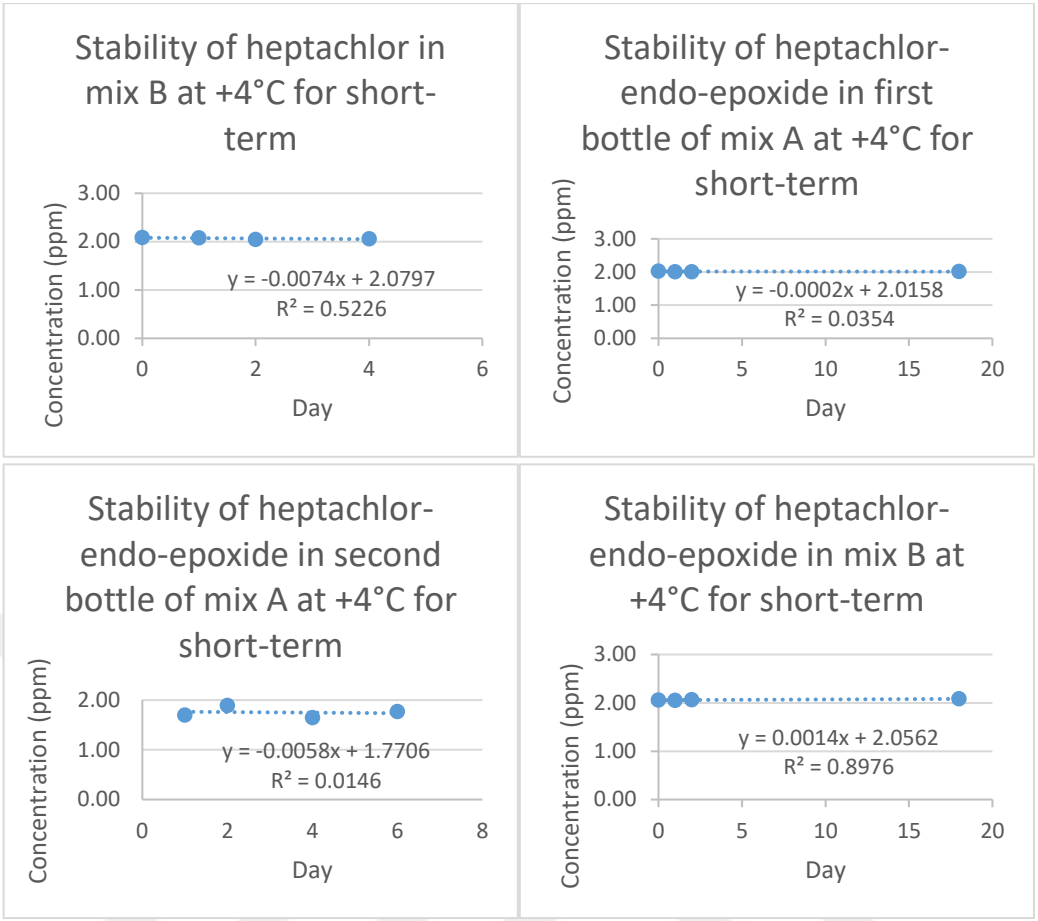
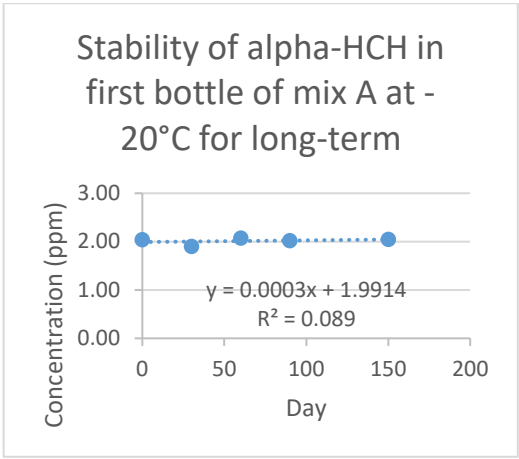
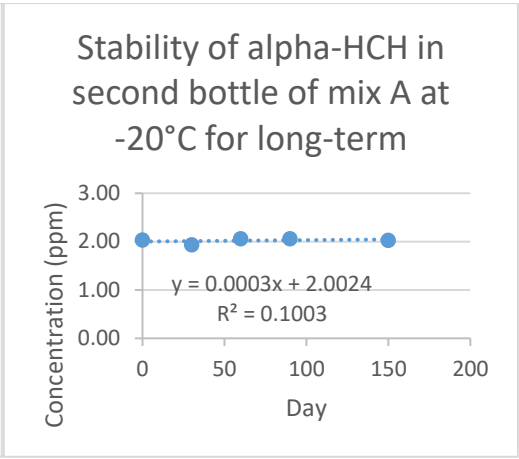
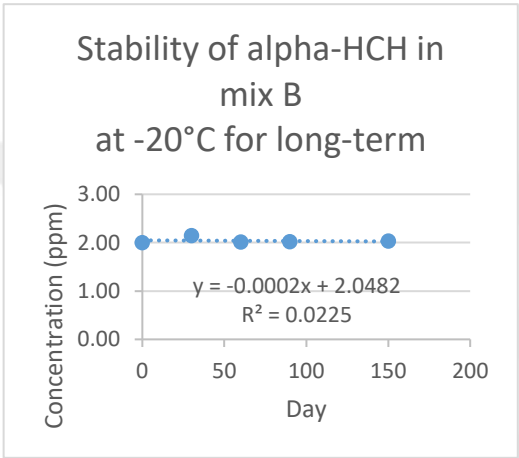
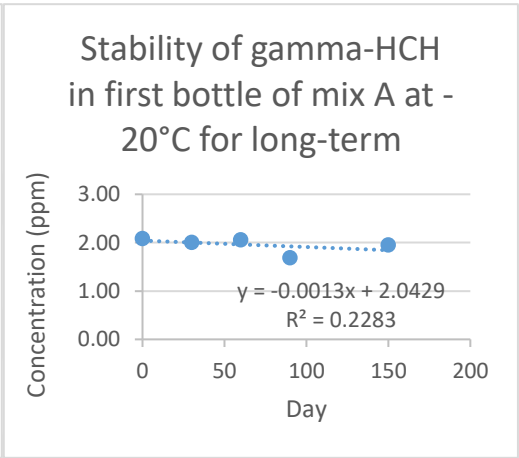


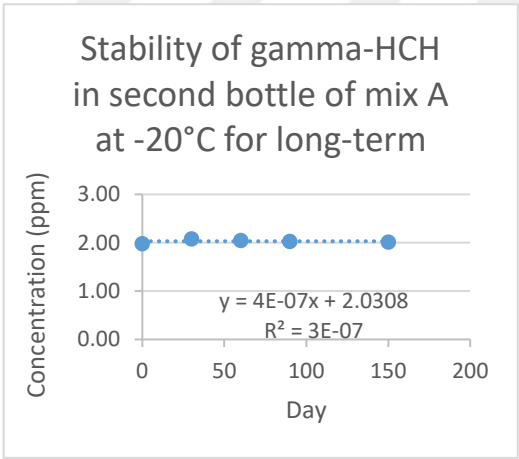
Figure 0.124. The plots of gravimetric mixtures (A and B) in short term stability at +4°C for each pesticide

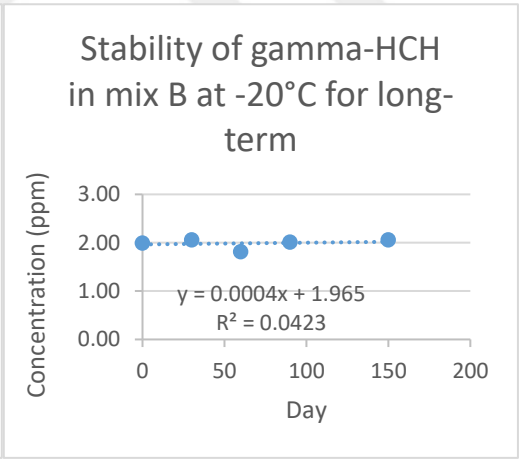

Stability of alpha-HCH in first bottle of mix A at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0003x + 1.9914
R² = 0.089
0
50
100
150
200
Day

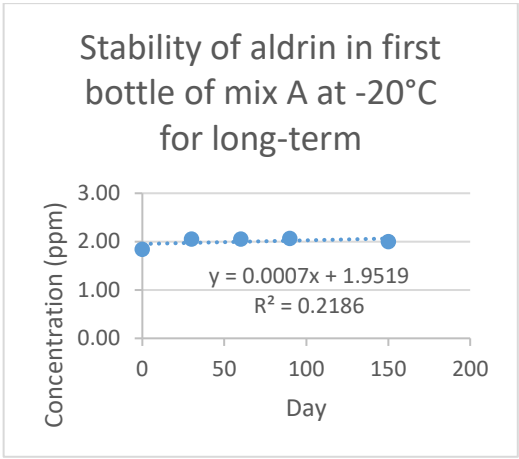

Stability of alpha-HCH in second bottle of mix A at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0003x + 2.0024
R² = 0.1003
0
50
100
150
200
Day

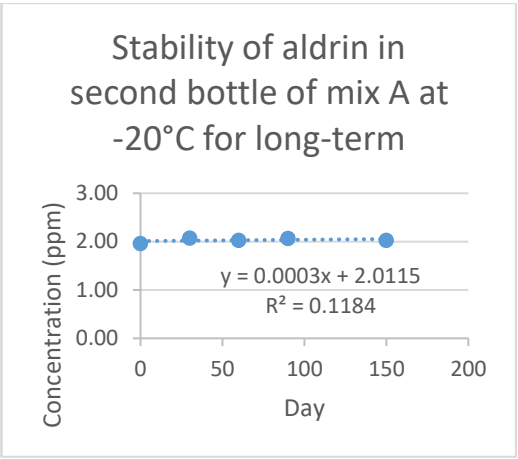

Stability of alpha-HCH in mix B at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0002x + 2.0482
R² = 0.0225
0
50
100
150
200
Day

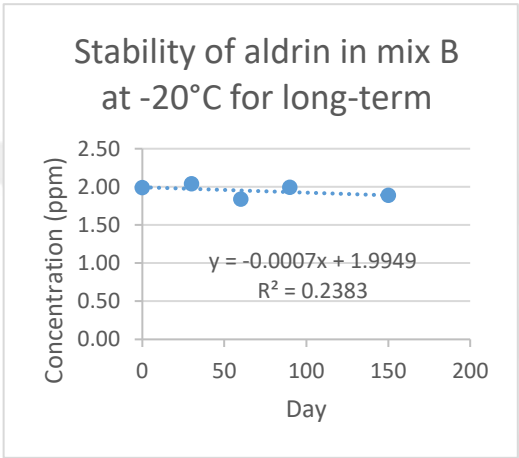

Stability of gamma-HCH in first bottle of mix A at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0013x + 2.0429
R² = 0.2283
0
50
100
150
200
Day

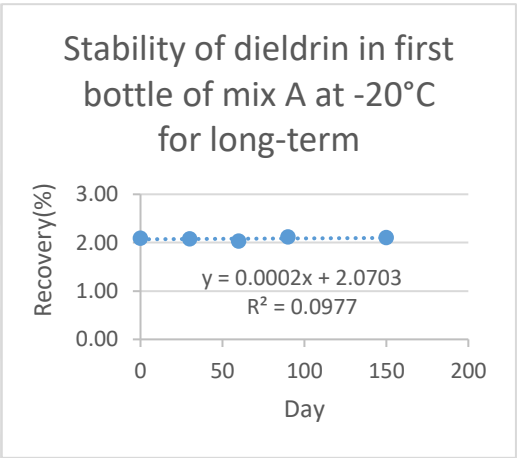

Stability of gamma-HCH in second bottle of mix A at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 4E-07x + 2.0308
R² = 3E-07
0
50
100
150
200
Day

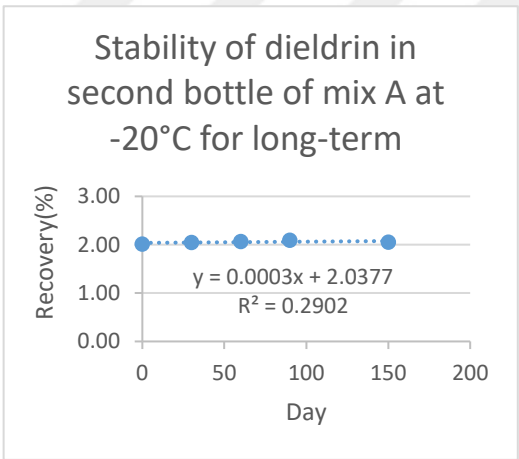

Stability of gamma-HCH in mix B at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0004x + 1.965
R² = 0.0423
0
50
100
150
200
Day

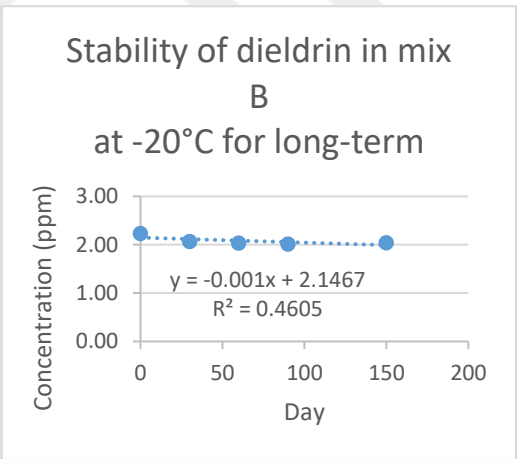

Stability of aldrin in first bottle of mix A at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0007x + 1.9519
R² = 0.2186
0
50
100
150
200
Day

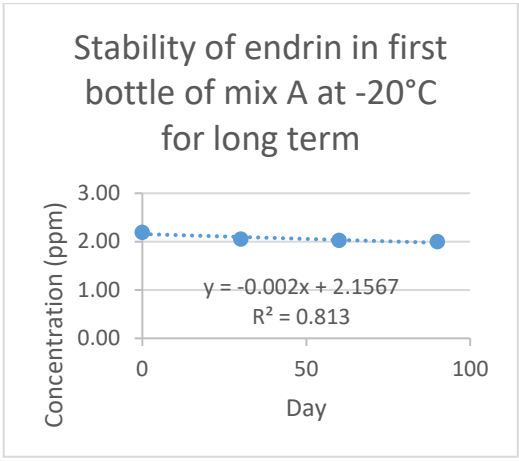

Stability of aldrin in second bottle of mix A at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0003x + 2.0115
R² = 0.1184
0
50
100
150
200
Day

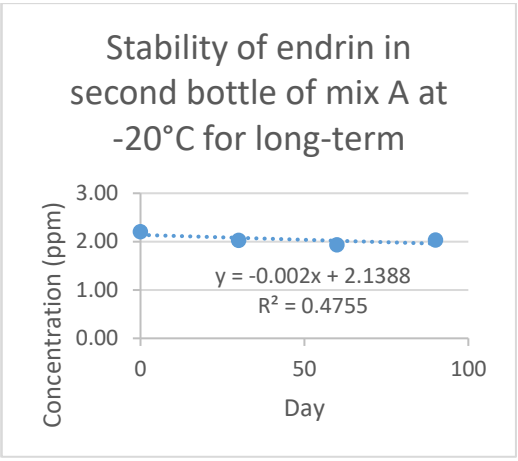

Stability of aldrin in mix B at -20°C for long-term
Concentration (ppm)
2.50
2.00
1.50
1.00
0.50
0.00
y = -0.0007x + 1.9949
R² = 0.2383
0
50
100
150
200
Day

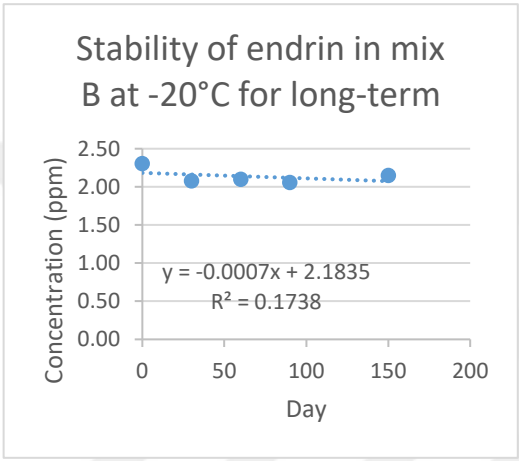

Stability of dieldrin in first bottle of mix A at -20°C for long-term
Recovery(%)
3.00
2.00
1.00
0.00
y = 0.0002x + 2.0703
R² = 0.0977
0
50
100
150
200
Day

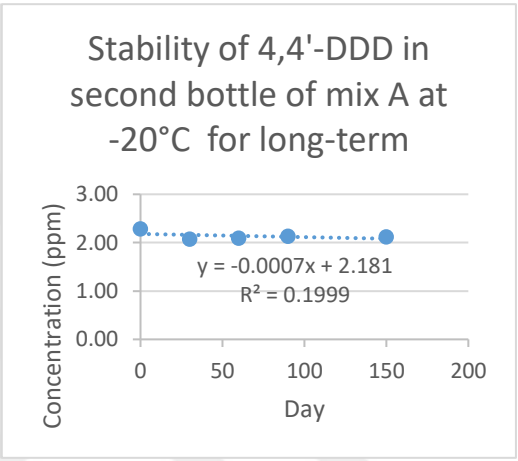

Stability of dieldrin in second bottle of mix A at -20°C for long-term
Recovery(%)
3.00
2.00
1.00
0.00
y = 0.0003x + 2.0377
R² = 0.2902
0
50
100
150
200
Day

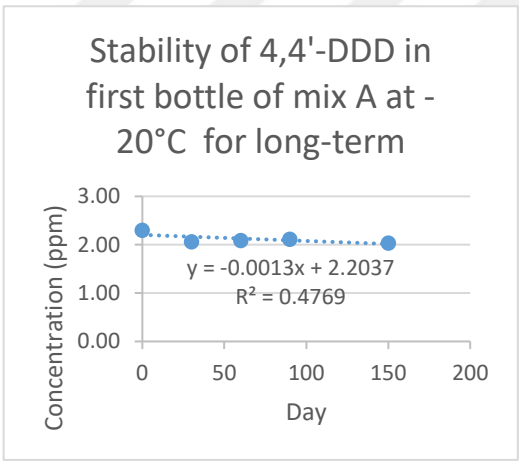

Stability of dieldrin in mix B at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.001x + 2.1467
R² = 0.4605
0
50
100
150
200
Day

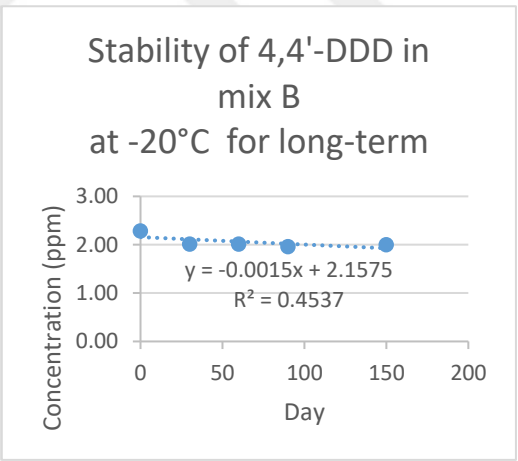

Stability of endrin in first bottle of mix A at -20°C for long term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.002x + 2.1567
R² = 0.813
0
50
100
Day

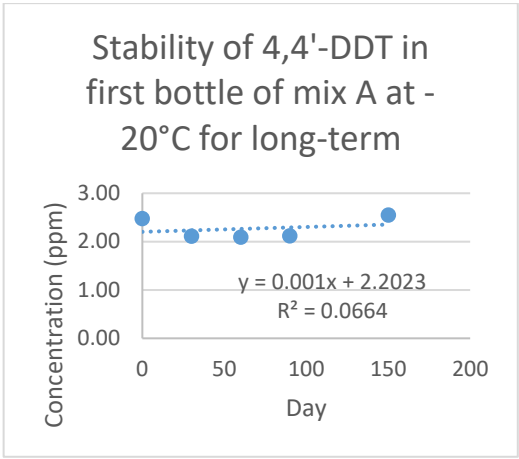

Stability of endrin in second bottle of mix A at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.002x + 2.1388
R² = 0.4755
0
50
100
Day

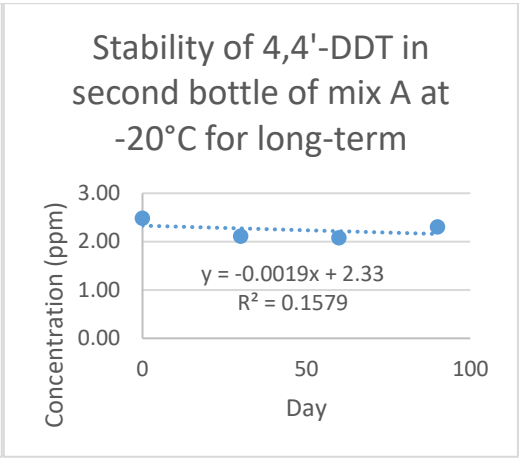

Stability of endrin in mix B at -20°C for long-term
Concentration (ppm)
2.50
2.00
1.50
1.00
0.50
0.00
y = -0.0007x + 2.1835
R² = 0.1738
0
50
100
150
200
Day

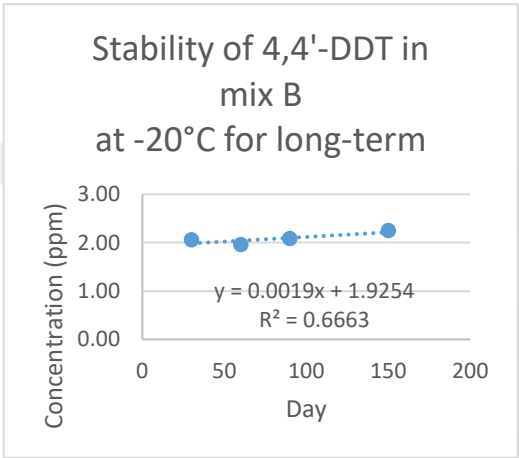

Stability of 4,4'-DDD in second bottle of mix A at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0007x + 2.181
R² = 0.1999
0
50
100
150
200
Day

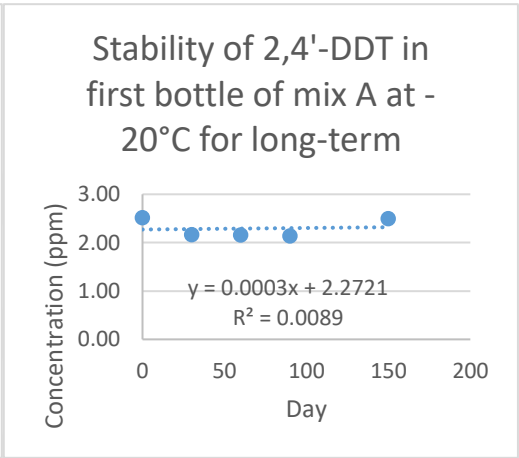

Stability of 4,4'-DDD in first bottle of mix A at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0013x + 2.2037
R² = 0.4769
0
50
100
150
200
Day

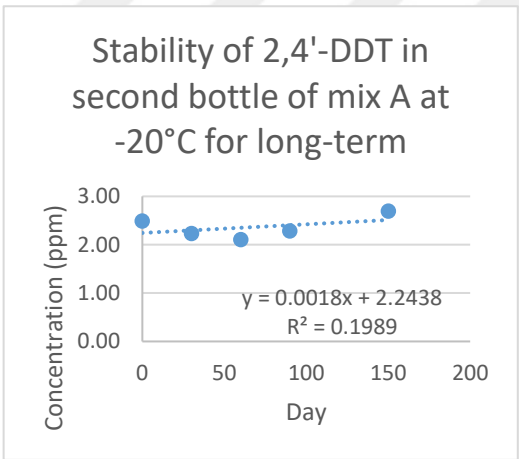

Stability of 4,4'-DDD in mix B at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0015x + 2.1575
R² = 0.4537
0
50
100
150
200
Day

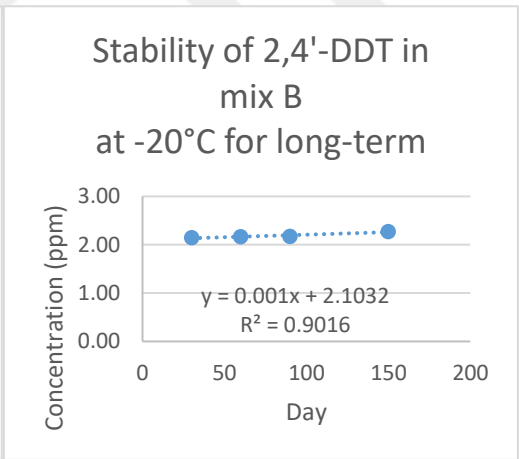

Stability of 4,4'-DDT in first bottle of mix A at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
0
50
100
150
200
Day
y = 0.001x + 2.2023
R² = 0.0664

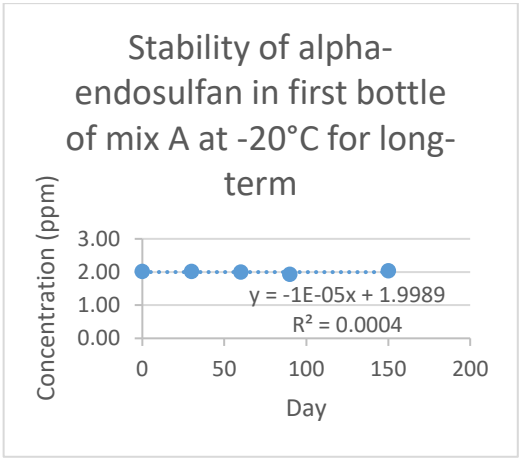

Stability of 4,4'-DDT in second bottle of mix A at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
0
50
100
Day
y = -0.0019x + 2.33
R² = 0.1579

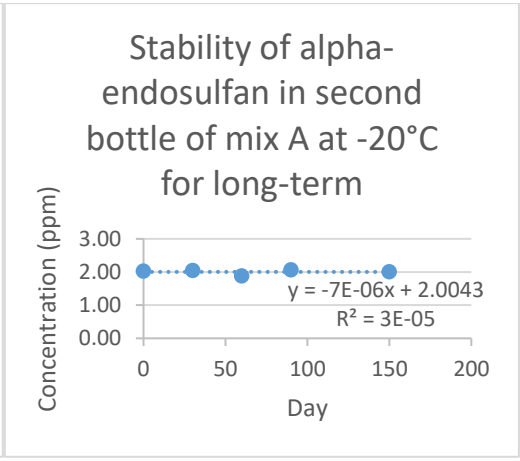

Stability of 4,4'-DDT in mix B at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
0
50
100
150
200
Day
y = 0.0019x + 1.9254
R² = 0.6663

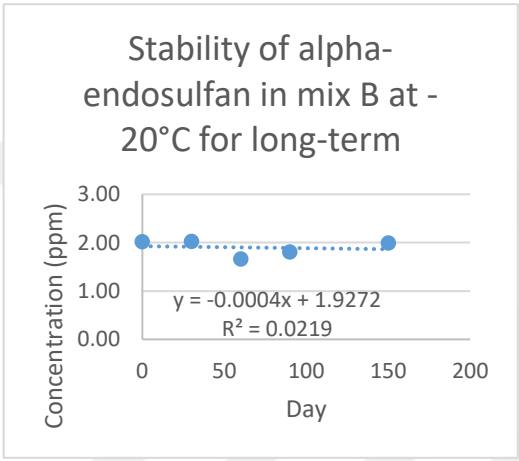

Stability of 2,4'-DDT in first bottle of mix A at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
0
50
100
150
200
Day
y = 0.0003x + 2.2721
R² = 0.0089

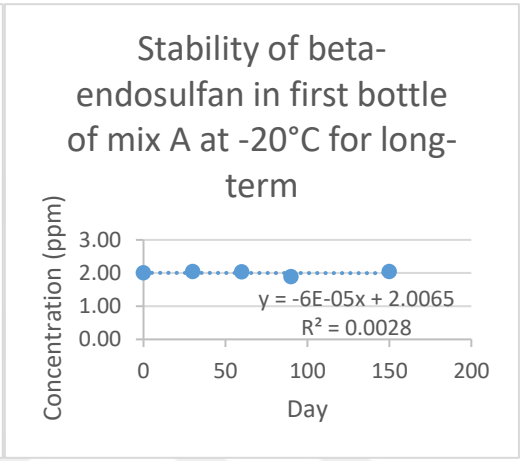

Stability of 2,4'-DDT in second bottle of mix A at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
0
50
100
150
200
Day
y = 0.0018x + 2.2438
R² = 0.1989

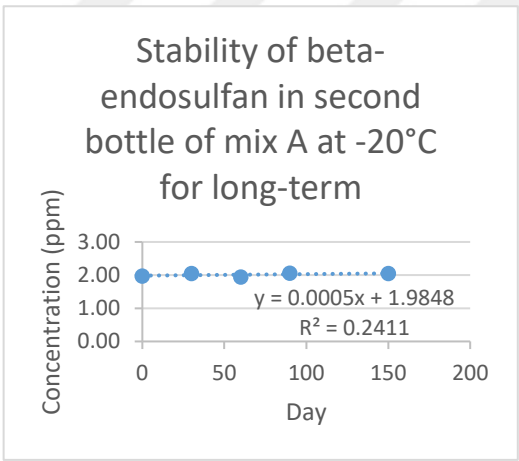

Stability of 2,4'-DDT in mix B at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
0
50
100
150
200
Day
y = 0.001x + 2.1032
R² = 0.9016

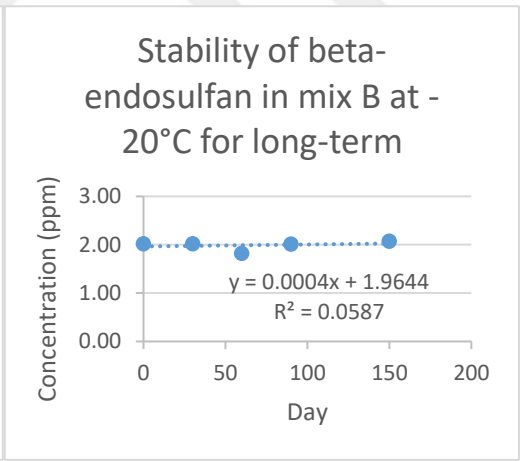

Stability of alpha-endosulfan in first bottle of mix A at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -1E-05x + 1.9989
R² = 0.0004
0
50
100
150
200
Day


Stability of alpha-endosulfan in second bottle of mix A at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -7E-06x + 2.0043
R² = 3E-05
0
50
100
150
200
Day


Stability of alpha-endosulfan in mix B at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -0.0004x + 1.9272
R² = 0.0219
0
50
100
150
200
Day


Stability of beta-endosulfan in first bottle of mix A at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = -6E-05x + 2.0065
R² = 0.0028
0
50
100
150
200
Day


Stability of beta-endosulfan in second bottle of mix A at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0005x + 1.9848
R² = 0.2411
0
50
100
150
200
Day


Stability of beta-endosulfan in mix B at -20°C for long-term
Concentration (ppm)
3.00
2.00
1.00
0.00
y = 0.0004x + 1.9644
R² = 0.0587
0
50
100
150
200
Day

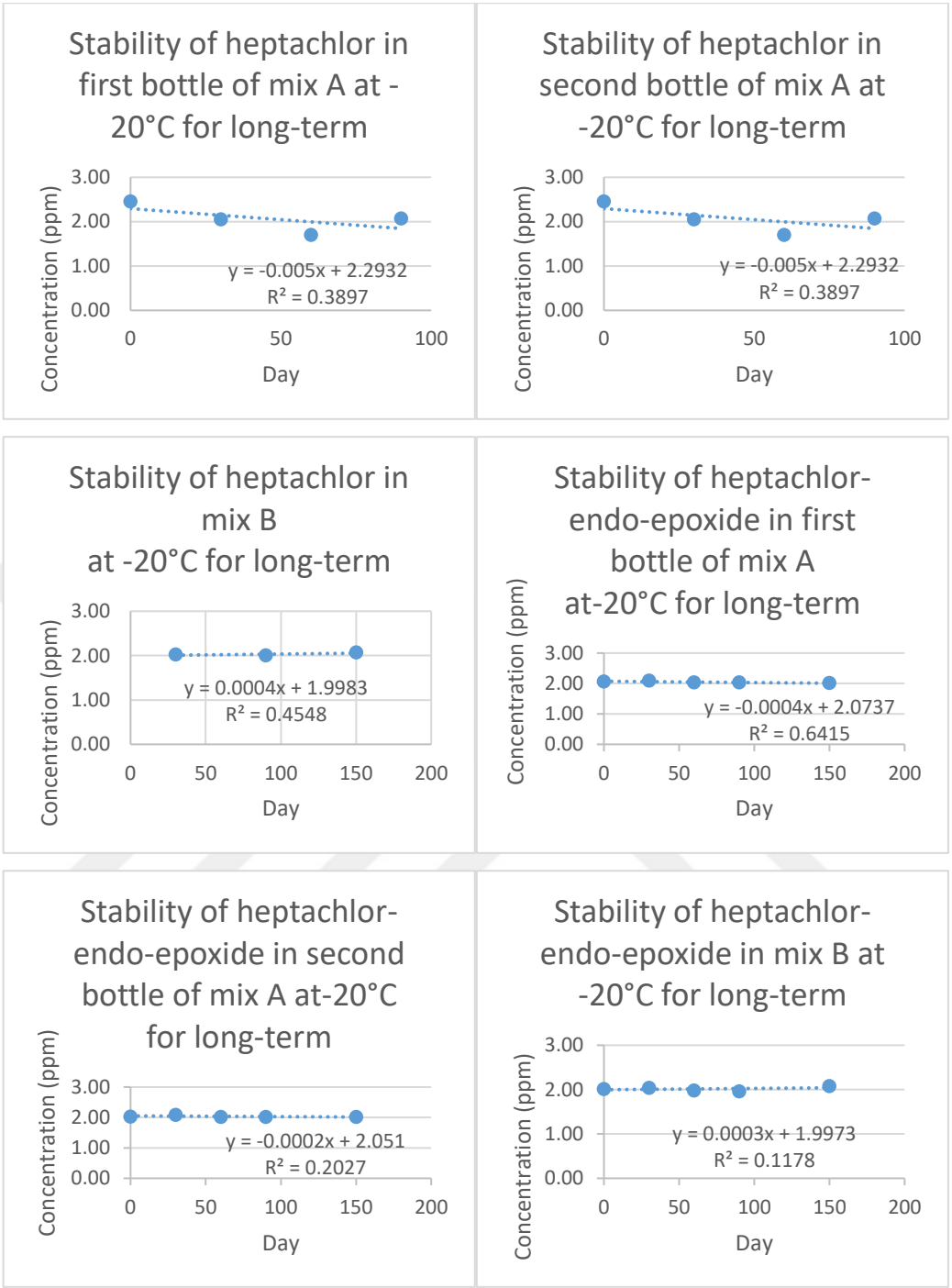


Figure 0.125. The plots of gravimetric mixtures (A and B) in long-term stability at -20°C for each pesticide