YOUNGER LABORATORIES
Biochemists . . . Pharmacologists . . . Analysts

5620 TELEGRAPH ROAD
ST. LOUIS 29, MISSOURI
PHONE: TILDEN 6-2540

Certificate of Analysis

C+2AM

June 25th, 1962

SUBJECT -

Toxicological Investigation Of: Aroclor 1262
Monsanto Sample Number 40
Monsanto Project Number Y-62-38

STUDY CONDUCTED FOR -

Monsanto Chemical Company, St. Louis, Missouri

EXPERIMENTAL PROCEDURE -

A) Oral LD_{50} (Rats)

The diluted compound was fed by stomach tube to Sprague-Dawley strain albino rats.

After the approximate Minimum Lethal Dose was determined, groups of male and female rats were fed in increasing doses at increments of 0.1 fractional log intervals at four levels designed to blanket the toxicity range thereby supplying data for calculation of the LD_{50} which was done according to a modification of the method of E. J. de Beer.

Observations were made for toxic symptoms and the viscera of the animals that succumbed were examined macroscopically.

The data, together with the dilution at which the compound was fed, are shown in Table I.

B) Skin Absorption MLD (Rabbits)

The diluted compound was applied in increasing doses at increments of 0.2 fractional log intervals to the closely clipped, intact skin of New Zealand white female rabbits.

The treated areas were covered with plastic strips and the animals placed in wooden stocks for periods up to twenty-four hours, after which time they were assign to individual cages.

Observations were made for toxic symptoms and the viscera of the animals that succumbed were examined macroscopically.

The data, together with the dilution at which the compound was applied, are shown in Table II.

GBRN002553

EXHIBIT
K-31

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COPY

To: Monsanto Chemical Company
St. Louis, Missouri
Younger Laboratories Certificate of Analysis - Page 2 (6/25/62) - Y-62-38

SUMMARY -

Aroclor 1262

A) Oral LD_{50} (Rats)

The Oral LD_{50} for male and female rats was placed at 11,300 milligrams per kilogram with lower and upper limits of 9940 to 12,680 milligrams per kilogram.

The compound was classed as practically non-toxic by oral ingestion in male and female rats.

B) Skin Absorption MLD (Rabbits)

The Minimum Lethal Dose by skin absorption in female rabbits was found to be greater than 1260 milligrams per kilogram and less than 3160 milligrams per kilogram.

There was one death and one survival at 2000 milligrams per kilogram.

The compound was classed as mildly toxic by skin absorption in female rabbits.

YOUNGER LABORATORIES

Fred M. Younger

BY: FRED M. YOUNGER

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— Monsanto Chemical Company

GBRN002554

TOWOLDMON0001868

TABLE I

THE ORAL LD_{50} OF 'Aroclor 1262' FOR RATS

Sample Fed As A 50.0% Solution In Corn Oil

Animal No. - Sex	Weight Gm.	Dose Mg./Kg.	Fate
1- Female	230	7,940	Survived
2- Female	215	7,940	Survived
3- Female	220	7,940	Survived
4- Male	235	7,940	Survived
5- Male	250	7,940	Survived
6- Male	230	10,000	Died
7- Female	215	10,000	Survived
8- Female	225	10,000	Died
9- Female	220	10,000	Survived
10- Male	230	10,000	Survived
11- Male	245	12,600	Died
12- Male	225	12,600	Died
13- Female	210	12,600	Survived
14- Female	220	12,600	Died
15- Female	225	12,600	Survived
16- Male	235	15,800	Died
17- Male	245	15,800	Died
18- Male	240	15,800	Died
19- Female	215	15,800	Died
20- Male	230	15,800	Died

DISCUSSION -

The Oral LD_{50} for male and female rats was placed at 11,300 milligrams per kilogram with lower and upper limits of 9940 to 12,880 milligrams per kilogram.

The compound was classed as practically non-toxic by oral ingestion in male and female rats.

Survival time was one to six days with most deaths occurring in three days.

Toxic symptoms included severe diarrhea, loss of appetite, lethargy, and increasing weakness.

At autopsy there was inflammation of the gastric mucosa, tissue edema, and liver congestion macroscopically.

GBRN002555

TOWOLDMON0001869

TABLE II

THE MINIMUM LETHAL DOSE OF 'Aroclor 1262'

BY SKIN ABSORPTION IN RABBITS

Sample Applied As A 50.0% Solution In Corn Oil

Animal No. - Sex	Weight Kg.	Dose Mg./Kg.	Weight Change 5 Days Later Kg.	Fate
1 - Female	2.2	794	- 0.1	Survived
2 - Female	2.7	1260	- 0.2	Survived
3 - Female	2.5	2000	- 0.3	Died — 7 Days
4 - Female	2.6	2000	- 0.2	Survived
5 - Female	2.4	3160	- 0.5	Died — 8 Days
6 - Female	2.7	5010	- 0.3	Died — 5 Days

DISCUSSION -

The Minimum Lethal Dose by Skin Absorption in female rabbits was found to be greater than 1260 milligrams per kilogram and less than 3160 milligrams per kilogram. There was one death and one survival at 2000 milligrams per kilogram.

The compound was classed as mildly toxic by skin absorption in female rabbits.

Survival time was five to eight days.

Toxic symptoms included poor appetite with resultant loss of weight, nervousness, increasing weakness, and sudden collapse.

At autopsy there was pulmonary hyperemia, liver discoloration, and renal congestion.

GBRN002556

TOWOLDMON0001870

HAZLETON LABORATORIES
Biochemists... Pharmacologists... Analysts
PHONE TILDEN 6-8240

Certificate of Analysis

June 25th, 1962

SUBJECT -

Toxicological Investigation Of: Aroclor 1254

Monsanto Sample Number 38
Monsanto Project Number T-62-36

STUDY CONDUCTED FOR -

Monsanto Chemical Company, St. Louis, Missouri

T-62-36
6/25/62

EXPERIMENTAL PROCEDURE -

A) Oral LD_{50} (Rats)

The undiluted compound was fed by stomach tube to Sprague-Dawley strain albino rats.

After the approximate Median Lethal Dose was determined, groups of male and female rats were fed in increasing doses at increments of 0.1 fractional log intervals at four levels designed to blanket the toxicity range thereby supplying data for calculation of the LD_{50} which was done according to a modification of the method of L. J. de Beer.

Observations were made for toxic symptoms and the viscera of the animals that succumbed were examined macroscopically.

The data are shown in Table I.

B) Skin Absorption LD_{50} (Rabbits)

The undiluted compound was applied in increasing doses at increments of 0.2 fractional log intervals to the closely clipped, intact skin of New Zealand white female rabbits.

The treated areas were covered with plastic strips and the animals placed in wire cages for periods up to twenty-four hours, after which time they were confined to individual cages.

Observations were made for toxic symptoms and the viscera of the animals that [illegible] were examined macroscopically.

The data are shown in Table II.

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K-32

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GBRN002557

TOWOLDMON0001871

SUBJECT -

Aroclor 1254

A) Oral LD_{50} (Rats)

The Oral LD_{50} for male and female rats was placed at 11,900 milligrams per kilogram with lower and upper limits of 10,475 to 13,450 milligrams per kilogram.

The compound was classed as practically non-toxic by oral ingestion in male and female rats.

B) Skin Absorption MLD (Rabbits)

The Minimum Lethal Dose by Skin Absorption in female rabbits was found to be greater than 1260 milligrams per kilogram and less than 2000 milligrams per kilogram.

The compound was classed as mildly toxic by skin absorption in female rabbits.

YOUNGER LABORATORIES

BY: FRED M. YOUNGER

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GBRN002558

TOWOLDMON0001872

TABLE I

THE ORAL LD_{50} OF 'Aroclor 1254' FOR RATS

Sample Fed Undiluted

Animal No. - Sex	Weight Gm.	Dose Mg./Kg.	Fate
1- Female	210	7,940	Survived
2- Female	200	7,940	Survived
3- Female	215	7,940	Survived
4- Male	230	7,940	Survived
5- Male	225	7,940	Survived
6- Male	240	10,000	Died
7- Female	215	10,000	Survived
8- Female	220	10,000	Died
9- Female	230	10,000	Survived
10- Male	245	10,000	Survived
11- Male	250	12,600	Survived
12- Male	235	12,600	Died
13- Female	215	12,600	Died
14- Female	225	12,600	Survived
15- Female	230	12,600	Died
16- Male	250	15,800	Died
17- Male	245	15,800	Survived
18- Male	230	15,800	Died
19- Female	215	15,800	Died
20- Male	240	15,800	Died

DISCUSSION -

The Oral LD_{50} for male and female rats was placed at 11,900 milligrams per kilogram with lower and upper limits of 10,475 to 13,450 milligrams per kilogram.

The compound was classed as practically non-toxic by oral ingestion in male and female rats.

Survival time was two to six days with most deaths occurring in three days.

Toxic symptoms included severe diarrhea, loss of appetite, lethargy, salivation, and increasing weakness.

At autopsy there was inflammation of the gastric mucosa, pulmonary hyperemia, and liver discoloration macroscopically.

GBRN002559

TOWOLDMON0001873

TABLE II

THE MINIMUM LETHAL DOSE OF 'Aroclor 1254' BY SKIN ABSORPTION IN RABBITS

Sample Applied Undiluted

Animal No. - Sex	Weight Kg.	Dose Mg./Kg.	Weight Change 5 Days Later Kg.	Fate
1 - Female	2.4	501	0.0	Survived
2 - Female	2.5	794	0.0	Survived
3 - Female	3.0	1260	- 0.2	Survived
4 - Female	2.7	2000	- 0.4	Died — 8 Days
5 - Female	2.5	3160	- 0.5	Died — 7 Days
6 - Female	2.6	5010	———	Died — 4 Days

DISCUSSION -

The Minimum Lethal Dose by Skin Absorption in female rabbits was found to be greater than 1260 milligrams per kilogram and less than 2000 milligrams per kilogram.

The compound was classed as mildly toxic by skin absorption in female rabbits.

Survival time was four to eight days.

Toxic symptoms included poor appetite, lethargy after two to three days, marked weight loss and increasing weakness. Animals #1 and #2 were little affected while #3 became moderately weak but was not in danger of collapse.

At autopsy there was renal congestion and liver discoloration (yellowish) macroscopically

GBRN002560

TOWOLDMON0001874

YOUNGER LABORATORIES
Biochemists . . . Pharmacologists . . . Analysts

8620 TELEGRAPH ROAD
ST. LOUIS 29, MISSOURI
PHONE: TILDEN 6-2540

Certificate of Analysis

June 25th, 1962

C+2SAP

SUBJECT -

Toxicological Investigation Of: Aroclor 1260

Monsanto Sample Number 39
Monsanto Project Number Y-62-37

STUDY CONDUCTED FOR -

Monsanto Chemical Company, St. Louis, Missouri

COPY

EXPERIMENTAL PROCEDURE -

A) Oral LD_{50} (Rats)

The diluted compound was fed by stomach tube to Sprague-Dawley strain albino rats.

After the approximate Minimum Lethal Dose was determined, groups of male and female rats were fed in increasing doses at increments of 0.1 fractional log intervals at four levels designed to blanket the toxicity range thereby supplying data for calculation of the LD_{50} which was done according to a modification of the method of E. J. de Beer.

Observations were made for toxic symptoms and the viscera of the animals that succumbed were examined macroscopically.

The data, together with the dilution at which the compound was fed, are shown in Table I.

B) Skin Absorption MLD (Rabbits)

The diluted compound was applied in increasing doses at increments of 0.2 fractional log intervals to the closely clipped, intact skin of New Zealand white female rabbits.

The treated areas were covered with plastic strips and the animals placed in wooden stocks for periods up to twenty-four hours, after which time they were assigned to individual cages.

Observations were made for toxic symptoms and the viscera of the animals that succumbed were examined macroscopically.

The data, together with the dilution at which the compound was applied, are shown in Table II.

GBRN002561

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EXHIBIT
K-33

SUMMARY -

Aroclor 1260

A) Oral LD_{50} (Rats)

The Oral LD_{50} for male and female rats was placed at 10,000 milligrams per kilogram with lower and upper limits of 8,600 to 11,600 milligrams per kilogram.

The compound was classed as practically non-toxic by oral ingestion in male and female rats.

B) Skin Absorption MLD (Rabbits)

The Minimum Lethal Dose by Skin Absorption in female rabbits was found to be greater than 1260 milligrams per kilogram and less than 2000 milligrams per kilogram.

The compound was classed as mildly toxic by skin absorption in female rabbits.

YOUNGER LABORATORIES

BY: FRET M. YOUNGER

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— Monsanto Chemical Company

TABLE I

THE ORAL LD_{50} OF 'Aroclor 1260' FOR RATS

Sample Fed As A 50.0% Solution In Corn Oil

Animal No. - Sex	Weight Gm.	Dose Mg./Kg.	Fate
1- Female	215	6,310	Survived
2- Female	230	6,310	Survived
3- Female	220	6,310	Survived
4- Male	245	6,310	Survived
5- Male	235	6,310	Survived
6- Male	250	7,940	Survived
7- Female	220	7,940	Survived
8- Female	210	7,940	Survived
9- Female	215	7,940	Died
10- Male	240	7,940	Survived
11- Male	225	10,000	Died
12- Male	235	10,000	Survived
13- Female	210	10,000	Survived
14- Female	225	10,000	Died
15- Female	210	10,000	Died
16- Male	230	10,000	Survived
17- Male	235	12,600	Died
18- Male	220	12,600	Died
19- Female	210	12,600	Survived
20- Female	215	12,600	Died
21- Male	240	12,600	Died

DISCUSSION -

The Oral LD_{50} for male and female rats was placed at 10,000 milligrams per kilogram with lower and upper limits of 8,600 to 11,600 milligrams per kilogram.

The compound was classed as practically non-toxic by oral ingestion in male and female rats.

Survival time was two to five days with most deaths occurring in three days.

Toxic symptoms included severe diarrhea, loss of appetite, and increasing lethargy and weakness.

At autopsy there was inflammation of the gastric mucosa and liver hyperemia macroscopically.

TOWOLDMON0001877

TABLE II

THE MINIMUM LETHAL DOSE OF 'Aroclor 1260' BY SKIN ABSORPTION IN RABBITS

Sample Applied As A 50.0% Solution In Corn Oil

Animal No. - Sex	Weight Kg.	Dose Mg./Kg.	Weight Change 5 Days Later Kg.	Fate
1 - Female	1.9	501	+ 0.1	Survived
2 - Female	2.2	794	0.0	Survived
3 - Female	2.4	1260	0.0	Survived
4 - Female	2.6	2000	- 0.4	Died — 8 Days
5 - Female	2.4	2000	- 0.4	Died — 7 Days
6 - Female	2.4	3160	- 0.5	Died — 7 Days

DISCUSSION -

The Minimum Lethal Dose by Skin Absorption in female rabbits was found to be greater than 1260 milligrams per kilogram and less than 2000 milligrams per kilogram.

The compound was classed as mildly toxic by skin absorption in female rabbits.

Survival time was seven to eight days.

Toxic symptoms included weight loss after two to three days with increasing weakness followed by collapse in six to seven days.

At autopsy there was evidence of liver dysfunction and renal hyperemia macroscopically.

GBRN002564

TOWOLDMON0001878