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December 2nd, 1970

Certificate of Analysis

C-25111

SUBJECT -

Toxicological Investigation Of: Aroclor 6037 -- MCS 1057-1
Monsanto Sample Number 120
Monsanto Project Number Y-70-114

STUDY CONDUCTED FOR -

Monsanto Company, St. Louis, Missouri

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EXPERIMENTAL PROCEDURE -

A) Oral LD_{50} (Rats, Mixed Sex)

The undiluted compound was fed by stomach tube to Sprague-Dawley strain albino male and female 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 the method of E. J. de Beer.

Observations were made for toxic signs and the viscera of the test animals were examined macroscopically.

The data are shown in Table I.

B) Skin Absorption MLD (Rabbits, Mixed Sex)

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 male and female rabbits.

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

Observations were made for toxic signs and the viscera of the test animals were examined macroscopically.

The data are shown in Table II.

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EXPERIMENTAL PROCEDURE - (Continued)

C) Skin Irritation (Rabbits, Mixed Sex)

0.5 Milliliter of undiluted compound was applied to the clipped, intact skin of New Zealand white male and female rabbits under a one inch by one inch square patch, two single layers thick. The patches were held in place with adhesive tape. The trunk of each animal was wrapped with plastic strips, to retard evaporation and avoid contamination, for the twenty-four hour exposure period.

Observations were made over a period of seven days for irritation.

The data, scored according to the method of Draize, Woodard and Calvery (Journal of Pharm. and Exp. Therapeutics, Volume 82, December, 1944) are shown in Table III.

D) Eye Irritation (Rabbits, Mixed Sex)

0.1 Milliliter of undiluted sample was placed in the conjunctival sac of the right eye of each of three albino male and female rabbits and observations made over a period of seven days for inflammation.

The eyes were rinsed with warm isotonic saline solution after twenty-four hours.

The data, scored according to the method of Draize, et al, are shown in Table IV.

E) Vapor Inhalation (Male Rats) - Ambient Temperature

Six mature male rats were placed in a metal chamber of 35-liters capacity and exposed for six hours to a concentrated atmosphere of vapors produced by passing a stream of air through 145.0 grams of the compound contained in a 500-milliliter erlenmeyer flask.

Vapors from the flask passed into a one liter bottle to remove droplets and then into the chamber.

Air flow through the sample was four liters per minute as measured by a calibrated rotameter. This was sufficient to violently agitate the liquid. No supplementary air was introduced inasmuch as the above supply was ample for the animals oxygen requirements.

The animals were observed for behavior during exposure and for ten days following exposure. The viscera of the test animals were examined macroscopically.

The data are shown in Table V.

SUMMARY -

Aroclor 6037 -- MCS 1057-1

A) Oral LD_{50} (Rats, Mixed Sex)

The Oral LD_{50} for male and female rats was placed at 4920 milligrams per kilogram with lower and upper limits of 4430 to 5460 milligrams per kilogram.

The compound was classed as slightly toxic by oral ingestion in male and female rats.

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SUMMARY - (Continued)

B) Skin Absorption MLD (Rabbits, Mixed Sex)

The Minimum Lethal Dose by Skin Absorption in male and female rabbits was found to be greater than 5010 milligrams per kilogram and less than 7940 milligrams per kilogram.

The compound was classed as practically non-toxic by skin absorption in male and female rabbits.

C) Skin Irritation (Rabbits, Mixed Sex)

The compound was classed as a mild irritant when applied undiluted to intact skin of male and female rabbits.

The average maximum score was 2.6 out of a possible 8 in twenty-four hours.

D) Eye Irritation (Rabbits, Mixed Sex)

The compound was classed as a slight eye irritant in male and female rabbits.

The average maximum score was 11.3 out of a possible 110 in one hour.

E) Vapor Inhalation (Male Rats) - Ambient Temperature

All animals survived the six hour exposure as well as the following ten day observation period.

It was concluded that the vapors were practically non-toxic under conditions of the test.

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BY: MELVIN D. BIRCH

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T A B L E I

THE ORAL LD_{50} OF 'Aroclor 6037 - MCS 1057-1' FOR RATS

Sample Fed Undiluted

Animal No. - Sex	Weight Gm.	Dose Mg./Kg.	Fate
1- Female	240	3160	Survived
2- Male	260	3160	Survived
3- Female	220	3160	Survived
4- Male	245	3160	Survived
5- Female	200	3160	Survived
6- Male	215	3980	Survived
7- Female	200	3980	Survived
8- Male	260	3980	Survived
9- Female	225	3980	Died
10- Male	240	3980	Survived
11- Female	215	5010	Survived
12- Male	245	5010	Survived
13- Female	210	5010	Died
14- Male	255	5010	Died
15- Female	220	5010	Died
16- Male	230	6310	Died
17- Female	200	6310	Died
18- Male	210	6310	Died
19- Female	205	6310	Survived
20- Male	250	6310	Died

DISCUSSION -

The Oral LD_{50} for male and female rats was placed at 4920 milligrams per kilogram with lower and upper limits of 4430 to 5460 milligrams per kilogram.

The compound was classed as slightly toxic by oral ingestion in male and female rats.

Survival time was two to three days.

Toxic signs included reduced appetite and activity, lethargy, increasing weakness, collapse, and death.

At autopsy there was hemorrhagic lungs, slight liver discoloration, and acute gastrointestinal inflammation.

Surviving animals were sacrificed seven days after dosing. Macroscopic examination revealed slight areas of lung congestion.

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T A B L E II

THE MINIMUM LETHAL DOSE OF 'Aroclor 6037 -- MCS 1057-1'
BY SKIN ABSORPTION IN RABBITS

Sample Applied Undiluted

Animal No. - Sex	Weight Kg.	Dose Mg./Kg.	Weight Change 5 Days Later Kg.	Fate
1 - Male	2.3	1260	0.0	Survived
2 - Female	2.2	2000	0.0	Survived
3 - Male	2.4	3160	+ 0.1	Survived
4 - Female	2.6	5010	- 0.3	Survived
5 - Male	2.4	5010	- 0.2	Survived
6 - Female	2.3	5010	- 0.3	Survived
7 - Male	2.3	7940	-----	Died -- 3 Days

DISCUSSION -

The Minimum Lethal Dose by Skin Absorption in male and female rabbits was found to be greater than 5010 milligrams per kilogram and less than 7940 milligrams per kilogram.

The compound was classed as practically non-toxic by skin absorption in male and female rabbits.

Survival time was three days for animal #7.

Toxic signs included reduced appetite and activity (for two to five days in survivors), increasing weakness, collapse, and death.

At autopsy there was hemorrhagic lungs, liver discoloration, enlarged gall bladder, and gastrointestinal inflammation.

Surviving animals were sacrificed fourteen days after dosing. The viscera appeared normal by macroscopic examination.

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TABLE III

SKIN IRRITATION IN RABBITS AFTER APPLICATION OF

'Aroclor 6037 -- MCS 1057-1'

Sample (0.5 Milliliter) Applied Undiluted

Animal No. - Sex	Numerical Evaluation At The End Of 1 Hour	24 Hours	48 Hours	72 Hours	120 Hours	168 Hours
1 - Female	0	2	1	0	0	0
2 - Female	0	3	1	0	0	0
3 - Male	0	3	1	0	0	0
Average	0.0	2.6	1.0	0.0	0.0	0.0

DISCUSSION -

The compound was classed as a mild irritant when applied undiluted to intact skin of male and female rabbits.

The average maximum score was 2.6 out of a possible 8 in twenty-four hours.

Observations following application --

1-Hour:	No skin changes; zero readings
24-Hours:	Slight erythema, barely perceptible edema in two instances
48-Hours:	Very slight erythema; no edema
72-Hours:	No erythema or edema; zero readings
120- 168-Hours:	No erythema or edema; zero readings

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TABLE IV

EYE IRRITATION IN RABBITS AFTER APPLICATION OF 'Aroclor 6037 -- MCS 1057-1'

Sample (0.1 Milliliter) Applied Undiluted

Animal No. - Sex	Numerical Evaluation At The End Of 1 Hour	24 Hours	48 Hours	72 Hours	120 Hours	168 Hours
1 - Female	12	6	2	0	0	0
2 - Male	10	4	0	0	0	0
3 - Male	12	6	0	0	0	0
Average	11.3	4.6	0.6	0.0	0.0	0.0

DISCUSSION -

The compound was classed as a slight eye irritant in male and female rabbits. The average maximum score was 11.3 out of a possible 110 in one hour.

Observations following application --

Immediate:	Discomfort was slight
10-Minutes:	Moderate erythema, copious discharge; no edema
1-Hour:	Slight to moderate erythema, barely perceptible edema, copious discharge
24-Hours:	Slight to moderate erythema, slight discharge; no edema
48-Hours:	Slight erythema in one instance; no edema or discharge
72-Hours:	Eyes normal; zero readings
120- 168-Hours:	Eyes normal; zero readings

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T A B L E V

INHALATION OF 'Aroclor 6037 -- MCS 1057-1' VAPORS BY RATS

Average Temperature Inside Chamber ..... 70° F.

Average Relative Humidity Inside Chamber ..... 56 %

Amount of Sample -- To start ..... 145.0 Grams
Recovered ..... 144.5 Grams
Vaporized or left in equipment ..... 0.5 Gram (0.3%)

Average Concentration Of Sample Entering Chamber ..... 0.354 cc/M³

Animal No. - Sex	Fate	Observations During Exposure
1 - Male	Survived	No nasal or ocular discharge ...
2 - Male	Survived	No weakness or drowsiness of consequence ...
3 - Male	Survived	Normal respiration.
4 - Male	Survived	
5 - Male	Survived	
6 - Male	Survived	

DISCUSSION -

All animals survived the six hour exposure as well as the following ten day observation period.

It was concluded that the vapors were practically non-toxic under conditions of the test.

Observations following exposure --

The animals appeared normal when removed from the chamber.

The ten day observation period was uneventful. There were no bronchial rales or other evidence of respiratory complications. Weight gain was normal.

Surviving animals were sacrificed ten days following exposure. The viscera appeared normal by macroscopic examination.

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