Scientific Associates

1474 S. Vandeventer Ave. · St. Louis 10, Mo.

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CERTIFICATE OF ANALYSIS

SUBJECT:

Toxicological Investigation of Pydraul F-9 (FH-103)

TESTS CONDUCTED FOR:

Monsanto Chemical Company, St. Louis, Missouri.
Monsanto Project No. SA-90

EXPERIMENTAL PROCEDURE:

A) Acute Oral Toxicity
The oral LD_{50} was found by the introduction of measured single doses of undiluted compound into the stomachs of Sprague-Dawley strain albino rats by means of a rubber catheter attached to a hypodermic syringe.
After the approximate Minimum Lethal Dose was determined, groups of rats were fed at levels designed to blanket the toxicity range thereby supplying data for calculation of the LD_{50}.
Selected animals from those succumbing were autopsied and macroscopic examination made of the viscera.
The data are shown in Table I.

B) Toxicity By Skin Absorption
Undiluted Pydraul F-9 (FH-103) was applied to the closely clipped intact skin of albino rabbits in varying amounts in order to find the Minimum Lethal Dose. The treated area was covered with a plastic shield to retard evaporation and the animals were placed in special cages to prevent them from licking off the sample.
The results are found in Table II.

C) Skin Irritation In Rabbits
The scoring method of Draize, Woodard and Calvery (J. of Pharm. and Exp. Therapeutics, Vol. 82, No. 2, Dec. 1944) was used in evaluating Pydraul F-9 (FH-103) as a skin irritant when placed on intact rabbit skin.
Observations made over a period of several days are scored in Table III.

D) Eye Irritation In Rabbits
Undiluted compound in the amount of 0.1 ml. was placed in the conjunctival sac of the right eye of each of three albino rabbits and the degree of irritation scored according to Draize, Woodard and Calvery (J. of Pharm. and Exp. Therapeutics, Vol. 82, No. 2, Dec. 1944).
The results are given in Table IV.

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EXPERIMENTAL PROCEDURE: (Continued)

E) Vapor Inhalation

Four mature male rats were placed in a small metal drum and exposed for six hours to a saturated atmosphere of Pydraul F-9 fumes by passing a stream of compressed air through a container of the fluid placed inside the chamber. Air pressure was 16 pounds per square inch. The animals were checked for symptoms of toxicity and all were held for seven days observation following exposure.

The data are shown in Table V.

SUMMARY:

The Oral LD_{50} of Pydraul F-9 (FH-103) for rats was found to be 24.0 grams per kilogram.

The Minimum Lethal Dose by skin absorption in rabbits was 2.0 - 2.8 grams per kilogram.

Slight redness with a trace of edema for an average score of 2.3 resulted from skin application.

Eye irritation amounted to moderate redness with slight edema for an average maximum score of 12.3 in 30 minutes. The iris and cornea were hardly affected.

No deaths resulted when rats were exposed to a saturated atmosphere of Pydraul F-9 for six hours.

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SCIENTIFIC ASSOCIATES

Fred M. Younger

BY: FRED M. YOUNGER

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— Monsanto Chemical Company

TABLE I

THE ORAL LD_{50} OF PYDRAUL F-9 (FH-103) FOR LABORATORY RATS

Animal No. - Sex	Weight Gm.	Dose Gm. / Kg.	Fate
1- Male	260	18.0	Survived
2- Male	275	18.0	Survived
3- Female	215	18.0	Survived
4- Male	240	18.0	Died
5- Male	230	18.0	Survived
6- Female	220	21.0	Died
7- Female	245	21.0	Survived
8- Male	250	21.0	Died
9- Female	195	21.0	Survived
10- Male	220	21.0	Survived
11- Male	250	24.0	Survived
12- Male	230	24.0	Died
13- Female	210	24.0	Died
14- Female	195	24.0	Survived
15- Female	235	24.0	Survived
16- Male	245	24.0	Died
17- Male	210	27.5	Died
18- Male	259	27.5	Died
19- Male	245	27.5	Died
20- Male	230	27.5	Survived
21- Male	265	27.5	Died

DISCUSSION:

The Oral LD_{50} was placed at 24.0 grams per kilogram. Survival time was one to eight days with severe diarrhea present in all animals. In all probability, part of the dose was excreted relatively unchanged due to the combination of diarrhea and high dosage. Appetite was affected but aside from the gastro-intestinal disturbances no other symptoms of toxicity were observed.

At autopsy the viscera appeared normal except for irritation of the digestive tract.

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TABLE II

THE MINIMUM LETHAL DOSE OF PYDRAUL F-9 (FH-103)

BY SKIN ABSORPTION

Animal No. - Sex	Weight Kg.	Dose Gm./Kg.	Weight Change 5 Days After Dosing %	Fate
1 - Male	2.1	0.8	0.0	Survived
2 - Male	1.8	1.4	- 7.5	Survived
3 - Female	1.7	2.0	- 6.0	Survived
4- Female	1.8	2.8	-10.0	Died -- 8 Days
5 - Male	1.9	3.6	-10.0	Died -- 5 Days
6 - Male	2.2	4.8	-15.0	Died -- 7 Days

DISCUSSION:

The Minimum Lethal Dose was found to be 2.0 to 2.8 grams per kilogram. Survival time was five to eight days. The animals became lethargic and lost appetite and weight before succumbing. They also developed multiple neuritis with partial paralysis of the hind quarters.

At autopsy the viscera appeared normal excepting for slight liver discoloration.

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T A B L E III

SKIN IRRITATION IN RABBITS AFTER APPLICATION OF PYDRAUL F-9 (FH-103)

Animal No. - Sex	Numerical Evaluation At The End Of 30 Min.	24 Hours	48 Hours	72 Hours
1 - Female	2	3	3	2
2 - Male	1	2	1	1
3 - Female	2	2	2	2
Average	1.6	2.3	2.0	1.6

DISCUSSION:

Slight redness with practically no edema was present within 30 minutes for an average score of 1.6 out of a possible 8.0. The score was 2.3 after 24 hours and was due to a slight increase in redness with a trace of edema. By the third day the sample had nearly disappeared from the surface of the skin and the average score had reduced to 1.6.

Pydraul F-9 (FH-103) was considered to be a mild skin irritant.

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TABLE V

VAPOR INHALATION OF PYDRAUL F-9 (FH-103) BY RATS

Animal No. - Sex	Fate	Concentration Of Pydraul F-9 Vapors In Chamber	Average Temperature Inside Chamber	Average Relative Humidity Inside Chamber
1 - Male	Survived	Saturated Atmosphere	76.5°F.	80.0%
2 - Male	Survived			
3 - Male	Survived			
4 - Male	Survived			

DISCUSSION:

The vaporized Pydraul F-9 settled quite rapidly on the fur of the animals and the chamber walls. Ocular and nasal irritation was moderate. Breathing became fairly heavy and irregular. Lethargy developed to a moderate extent shortly after exposure began.

The animals were quite exhausted when taken out of the chamber but all had regained normal activity and appetite within 48 hours following exposure. There were no deaths either during or following exposure.

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