DATA EVALUATION RECORD

(1) CHEMICAL: Trichlorfon

(2) TYPE OF FORMULATION: Not specified

(3) CITATION: Wojcik, J. 1972. [Experiments on the effects of Foschlor in drinking water on some of the histochemical reactions of the liver of white rats under long-term experimental conditions.] Rocz. Panstw. Zakl. Hig. 23:365-370 (Translated from Polish)

(4) REVIEWED BY:

Gregory Helms
Staff Scientist
Clement Associates
Washington, D.C.
(202) 333-7990

Signature: _____

Date: _____

Douglas Wilkening
Staff Scientist
Clement Associates
Washington, D.C.
(202) 333-7990

Signature: _____

Date: _____

(32B-0069)

(5) APPROVED BY:

Signature: _____

Date: _____

(6) TOPIC: This study has information pertinent to discipline toxicology, topic subchronic oral toxicity. It relates to the Proposed Guidelines data requirement 163.82-1.

(7) CONCLUSION: This study shows that at an approximate dose of 60 mg/kg/day, trichlorfon induced histologic changes in the liver of rats. These changes included focal changes resulting in a foamy appearance, fat accumulation, glycogen depletion, and an increase in acid phosphatase activity.

CORE CLASSIFICATION: Supplementary. The reporting of results was in summary form only.

(8) MATERIALS AND METHODS:

Test Material: Foschlor (trichlorfon) of unspecified source and purity was tested in this study.

Organism: The test animals were 5-week-old white female rats, bred in the author's laboratory. The rats were fed a standard laboratory feed and water ad libitum throughout the study.

Experimental Procedure: The test animals (groups of 10) were administered the test material dissolved in their daily water supply. Doses were specified as 0.6, 6.0 and 60 mg/kg/day for the three test groups. The dosing period was 6 months, after which the rats were sacrificed by decapitation. Liver sections were fixed in Baker's solution and in Carnoy's solution at 4°C. Sections were stained with hemotoxylin and eosin, glycogen was detected

by the periodic acid-Schiff reagent, RNA was detected by toluidine blue by the method of Brachet (reference not given), and the fats from the material stained in Baker's solution were determined using Sudan IV. The activities of succinate dehydrogenase and cytochrome oxidase were measured in unstained sections by an unspecified method. Alkaline and acid phosphatase and nonspecific esterase activities in sections fixed in Baker's solution were determined by the conjugation method (reference not given). No other details of the methods used were specified.

(9) REPORTED RESULTS: Microscopic examination of the slides stained with hematoxylin and eosin showed varying degrees of focal changes of the parenchyma cells in the 60 mg/kg/day group. The cells were described as enlarged, containing nuclei with "markedly indicated chromatin" and a micro nucleus, and others with a weakly outlined nucleus. The cytoplasm was reported to appear foamy.

The glycogen levels of the control and test rat liver cells were somewhat different from one another. The cytoplasm of the control liver cells was reported to be "tightly filled" with glycogen. The test animals' liver cells were reported to show fluctuations in glycogen content, especially in the high-dose group. Various sizes of cell groups with small or trace quantities of glycogen were reported to occur frequently in the high-dose animals,

and it was also noted that these were the same cells showing damage with hematoxylin and eosin.

The staining of the control liver cells with toluidine blue (for RNA) was reported to be strong, with discreet granules and lumps of the cytoplasm staining most intensely. The liver of the test rats was reported to have "an overall slight weakening of the affinity of the cytoplasm" for the toluidine blue dye, especially at the higher levels.

The staining with Sudan IV for fat bodies showed deposits to exist primarily in the livers of the high-dose rats, and not in these of the controls. They were described as spherical and varied in size. The author identified these cells as the same ones that showed damage when stained with hematoxylin and eosin.

In the test for nonspecific esterases, only a few areas of the liver from the high-dose rats showed any change from the control. They characterized the change as a "stronger reaction of the test enzyme."

The acid phosphatase test showed the low-dose rats to be approximately the same as the controls. At the high-dose level however, "numerous cells of the liver were distinguished by a stronger reaction to acid phosphase...." In the alkaline phosphatase tests, no difference between test and control rats was found.

In the test for succinate dehydrogenase, the test and control rats were reported to be generally the same,

except for some areas of the liver of the high-dose rats, which were reported to have a "slight weakening of the reaction" in the cells with fat deposits.

The test for cytochrome oxidase was reported to show differences only between the high-dose group and the control group livers. The affected areas of liver "showed a weaker reaction to cytochrome oxidase," and were usually cells that showed some damage and contained fat bodies.

(10) DISCUSSION: Several problems exist in this study, which limit its usefulness. These are mainly the reporting of results in summary form only, and dosing based on a precalculated level of water consumption, which was not verified in the report.

However, these problems do not invalidate the study, and the information on liver toxicity gives some useful information on the effects of trichlorfon. The reported focal changes that resulted in foamy appearance of the liver, fat accumulation, and other effects noted are useful in assessing the overall effects of trichlorfon.

(11) TECHNICAL REVIEW TIME: 5.5 hours