REPORT TO

MONSANTO COMPANY

ACUTE VAPOR INHALATION TOXICITY STUDY WITH MCS 1016 IN ALBINO RATS

JANUARY 28, 1971

IBT NO. N9379

I. Introduction

A sample identified as MCS 1016 was received December 1, 1970, from Monsanto Company for the purpose of conducting a four-hour acute vapor inhalation toxicity study employing albino rats as experimental animals.

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II. Summary

An acute vapor inhalation toxicity study was conducted on MCS 1016 wherein ten albino rats were exposed four hours to vapor of the test material at an average nominal vapor concentration of 3.7 mg/L air. Following exposure, the animals were observed for a period of 14 days.

No deaths, untoward behavioral reactions, adverse effects on body weight or gross pathologic alterations were observed among any experimental animals.

Respectfully submitted,

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III. Procedure

Young adult, albino rats of the Charles River strain (COBS)* having an average body weight of 180 grams were employed as test animals. Ten rats (five males and five females) were selected after having been under observation for at least five days to insure their general health and suitability for testing. The animals were housed individually in stock cages and permitted a standard laboratory diet** plus water ad libitum, except during inhalation exposure.

The exposure was designed to run for a four-hour period, during which time observations were made with respect to incidence of mortality and reactions displayed. At the end of the exposure period, the rats were returned to their stock cages and observed for the following 14 days.

A body weight was determined for each animal prior to inhalation exposure and for each surviving animal at the end of the 14-day observation period. The data were recorded as an index to body weight effects.

Gross pathologic examinations were scheduled to be conducted upon all animals which might succumb during the test period and upon those sacrificed at the end of the 14-day observation period.

* Charles River Breeding Laboratories, Inc., North Wilmington, Mass.
** Purina Rat Chow, Ralston Purina Company, St. Louis, Mo.

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Test animals were exposed in a specially constructed Plexiglas inhalation chamber having a capacity of 70 liters. The chamber was designed so that the animals could be introduced to the test atmosphere after 99 percent of the maximum vapor concentration was established. Each animal was caged separately during exposure to minimize filtration of inspired air by animal fur.

Vapor was generated by bubbling a stream of clean dry air (-40°C dewpoint) through the undiluted test material. The resulting air-vapor mixture was introduced into the exposure chamber at the top center, dispersed by a baffle plate and exhausted at the bottom of the chamber. The vapor generator was all-glass construction and was linked to the exposure chamber by a short length of Tygon tubing. Air flow rate through the system (1.8 L/min at 29.92 inches Hg and 25°C) was measured with a rotameter connected upstream of the generator. The rotameter was calibrated with a wet-test meter after the exposure was completed. The temperature of the test atmosphere was 27 °C and the pressure was 29.05 inches Hg. The average nominal vapor concentration, calculated by dividing the generator weight loss by the total volume of air used during the test, was 3.7 mg/L air at 29.92 inches Hg and 25 °C.

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In the event of significant mortality following the initial exposure, arrangements were made to conduct additional experiments at lower vapor concentrations in order to acquire data sufficient to calculate the acute vapor inhalation median lethal concentration (LC_{50}) of the test material employing the method of Litchfield and Wilcoxon*.

* Litchfield, J. T., Jr., and Wilcoxon, F., "A Simplified Method of Evaluating Dose-Effect Experiments", J. Pharm. & Exp. Ther., Vol. 96, No. 2, pp. 99-113 (1949).

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IV. Results

No deaths or untoward behavioral reactions were observed among any test animals either during exposure or during the 14-day observation period which followed.

No adverse body weight effects were noted. The average two-week body weight gain was 97 grams which is within the normal range.

Necropsy of all animals sacrificed at the end of the 14-day observation period did not reveal any gross pathologic changes in the tissues and organs examined.

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