

*Industrial* **BIO-TEST** *Laboratories, Inc.*

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REPORT TO

MINNESOTA MINING AND MANUFACTURING COMPANY

ACUTE ORAL TOXICITY STUDIES ON  
TWO MATERIALS

IBT NO. A4414

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I. Introduction

Samples of two materials identified as L-1931 (20470-23P) and L-1932 (20430-39D) respectively, were received from Minnesota Mining and Manufacturing Company for the purpose of conducting acute oral toxicity studies employing albino rats as test animals.

II. Procedure

The procedure followed in the evaluation of each test material was the same and is described below.

Healthy, young albino rats of the Sprague-Dawley strain with a body weight range from 150 to 200 grams were used as test animals. The rats were divided into groups of four animals each (two male and two female) for dosing purposes.

All animals used were kept under observation for five days prior to experimental use, during which period they were checked for general physical health and suitability as test animals. The animals were housed

in stock cages and permitted a standard laboratory rat diet\* plus water ad libitum until 16 hours immediately prior to oral intubation.

On the morning of the first test day, after a 16-hour fast (water permitted), the selected dose groups of four rats each (two male and two female) were intubated with previously calculated doses of the test material in the form of an aqueous suspension. All doses were administered directly into the stomachs of the rats using a hypodermic syringe equipped with a ball-pointed intubating needle.

Following oral administration of the test material, the rats were housed individually in observation cages ( 10" x 8" x 8") and observed for the succeeding 30 days. All mortalities and/or reactions displayed were recorded.

Arrangements were made to autopsy any animal which might succumb during the study as well as all surviving animals at the end of the 30 days.

At the end of the observation period, all data were collected and arrangements were made to calculate the acute oral mean lethal dose (LD50) of the test material using the techniques of Weil\*\*, Thompson\*\*\*, and Thompson and Weil\*\*\*\*.

\* Wayne Lab Blox, Allied Mills, Chicago, Illinois.

\*\* Weil, Carrol S. : Tables for Convenient Calculation of Median-Effective Dose (LD50 or ED50) and Instructions in Their Use. Biometrics, Sept. 1952.

\*\*\* Thompson, William R. : Use of Moving Averages and Interpolation to Estimate Median-Effective Dose. Bact. Rev., Nov. 1947.

\*\*\*\* Thompson, William R. and Weil, Carrol S. : On the Construction of Tables for Moving Average Interpolation. Biometrics, March 1952.

III. ResultsA. Mortality

The mortality data are presented in Tables I and II.

TABLE I

TEST MATERIAL: L-1931

Acute Oral Toxicity - Albino Rats

Mortality Data

| Dose*<br>(g/kg) | Number<br>Dead | Number<br>Tested | Per Cent<br>Dead |
|-----------------|----------------|------------------|------------------|
| 1.4             | 1              | 4                | 25               |
| 2.0             | 1              | 4                | 25               |
| 3.0             | 2              | 4                | 50               |
| 4.6             | 4              | 4                | 100              |

Acute Oral  $LD_{50} = 2.6$  g/kg  
Standard Deviation of  $LD_{50} = \pm 0.6$  g/kg

\* The test material was administered as a 25 per cent (w/v) aqueous suspension.

TABLE II

TEST MATERIAL: L-1932

Acute Oral Toxicity - Albino Rats

Mortality Data

| Dose*<br>(g/kg) | Number<br>Dead | Number<br>Tested | Per Cent<br>Dead |
|-----------------|----------------|------------------|------------------|
| 0.6             | 0              | 4                | 0                |
| 0.9             | 2              | 4                | 50               |
| 1.4             | 4              | 4                | 100              |
| 2.0             | 4              | 4                | 100              |

Acute Oral  $LD_{50} = 0.9$  g/kg  
Standard Deviation of  $LD_{50} = \pm 0.1$  g/kg

\* The test material was administered as a 10 per cent (w/v) aqueous suspension.

B. Reactions

Summaries of the untoward behavioral reactions and time of death following oral administration of the respective test materials are presented in Tables III and IV.

Necropsy of animals which died during the study as well as those sacrificed at the end of the 30-day observation period revealed no significant gross pathologic alterations in the tissues and organs examined.

TABLE III

TEST MATERIAL: L-1931

Acute Oral Toxicity - Albino Rats

Summary of Reactions

| Dose (g/kg) | Reaction  | Time of Onset Following Dose Administration (minutes) | Duration of Reaction (days)                  | Time of Death Following Dose Administration (days) |
|-------------|---|---|--|--|
| 1.4 and 2.0 | Hypoactivity<br>Ruffed fur<br>Emaciation                      | 90<br>6-22 hours<br>2-3 days                          | 5<br>4-5 or<br>until death                   | 5  |
| 3.0 and 4.6 | Hypoactivity<br>Muscular weakness<br>Ruffed fur<br>Emaciation | 30<br>30<br>6-22 hours<br>6-22 hours                  | 5 or<br>until death<br>4-5 or<br>until death | 2-3  |

TABLE IV

TEST MATERIAL: L-1932

Acute Oral Toxicity - Albino Rats

Summary of Reactions

| Dose (g/kg) | Reaction               | Time of Onset Following Dose Administration (hours) | Duration of Reaction (hours) | Time of Death Following Dose Administration (days) |
|-------------|------------------------|---|------------------------------|--|
| 0.6         | Hypoactivity           | 1/2   | 1                            | -  |
|             | Ptosis                 | 1/2   | 1                            |  |
|             | Muscular weakness      | 1/2   | 1                            |  |
| 0.9         | Hypoactivity           | 1/2   | 5 days or until death        | 4-5  |
|             | Ptosis                 | 1/2   |                              |  |
|             | Muscular weakness      | 1/2   |                              |  |
|             | Sneezing               | 1/2   | 5 minutes                    |  |
|             | Ruffed fur             | 6-22 hours  | 5 days or until death        |  |
| 1.4 and 2.0 | Ruffed fur             | 4 minutes   | Until death                  | 2-6  |
|             | Sneezing               | 8 minutes   | 2 minutes                    |  |
|             | Hypoactivity           | 20 minutes  | Until death                  |  |
|             | Ptosis                 | 20 minutes  | 6-22                         |  |
|             | Alopecia*              | 1-2 days  | Until death                  |  |
|             | Emaciation             | 1-2 days  | Until death                  |  |
|             | Bloody nasal discharge | 1-2 days  | Until death                  |  |

\* This reaction was noted only in one animal in the 1.4 g/kg dose group.



IV. Summary

Acute oral toxicity studies employing albino rats as test animals were conducted on two materials identified as L-1931 (20470-23P) and L-1932 (20430-39D) respectively. The test materials were administered in the form of aqueous suspensions. The acute oral mean lethal dose values (LD<sub>50</sub>), expressed in terms of undiluted test material, were  $2.6 \pm 0.6$  g/kg for L-1931 and  $0.9 \pm 0.1$  g/kg for L-1932 respectively.

Respectfully submitted,

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