UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

8032

JUL 12 1990

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

MEMORANDUM

SUBJECT: Malathion - Mutagenicity Data Submitted under MRID No. 409393-02
EPA ID No. 114 (057701-5)

Chemical (Caswell) No.: 535
RD Record No.: 260,042
HED Project No.: 0-0754

FROM: Irving Mauer, Ph.D., Geneticist 6-21-90
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Toxicology Branch I - Insecticide, Rodenticide Support
Health Effects Division (H7509C)

Registrant: American Cyanamid, Princeton, NJ

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Request

Review and evaluate the following mutagenicity study performed at the registrant's Agricultural Research Division laboratory:

> Evaluation of CL 6601 in the Bacterial/Microsome Mutagenicity Test (Ames), Lab. Study No. 114, Final Report dated March 9, 1987 (EPA MRID No. 409393-02).

TB Conclusion

This study is judged ACCEPTABLE in demonstrating malathion was negative for inducing reverse gene mutation in Ames testing at concentrations up to 5000 ug/plate.

Attachment (DER)

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Reviewed By: Irving Mauer, Ph.D., Geneticist
Toxicology Branch I - IRS (H7509C)
Secondary Reviewer: Karl P. Baetcke, Ph.D., Chief
Toxicology Branch I - IRS (H7509C)

DATA EVALUATION RECORD

I. SUMMARY

MRID (Acc) No.: 409393-02
ID No.: 057701-5
PP Record No.: 260,042
Caswell No.: 535
Project No.: 0-0754

Study Type: Mutagenicity - Reverse gene mutation in bacteria (Ames test)

Chemical: Malathion

Synonyms: CL 6601

Sponsor: American Cyanamid, Princeton, NJ

Testing Facility: Agricultural Research Division

Title of Report: Evaluation of CL 6601 in the Bacterial/ Microsome Mutagenicity Test.

Authors: K.A. Traul

Study Number: 114

Date of Issue: March 9, 1987

TB Conclusions:

Negative for reverse gene mutation in the standard battery of five Salmonella (his$^-$) strains plus E. coli WP-2 cells exposed in replicate assays with/without metabolic activation to concentrations up to 5000 ug/plate.

Classification (Core-Grade) - ACCEPTABLE

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II. DETAILED REVIEW

A. Test Material - CL 6601 (Malathion tech.)

Description: Light yellow liquid
Batch (Lot): AC 4870-54B
Purity (%): 95.2
Solvent/Carrier/Diluent: Dimethylsulfoxide

B. Test Organisms - Bacteria

Species: (1) Salmonella typhimurium; (2) Escherichia coli
Strains: (1) TA98, TA100, TA1535, TA1537, TA1538 (all his$^-$); (2) WP-2 (uvrA$^-$/trp$^-$)
Sources: (1) Bruce Ames, UCal (Berkeley);
(2) B. Bridges, Univ. Sussex, Brighton (UK)

C. Study Design (Protocol) - This study was designed to assess the mutagenic potential of malathion when administered in vitro to bacterial strains according to established (published) methods.

A statement affirming compliance with Agency GLPs was provided.

A Statement of Quality Assurance measures (inspections/audits) was also provided.

D. Procedures/Methods of Analysis - Triplicate cultures of each of the six bacterial strains were exposed by the Ames plate incorporation method to each of five concentrations of test article (100, 500, 1000, 2500, and 5000 ug/plate) for 48 hours, both in the absence and presence of a commercially available mammalian metabolic activation system (from Microbiological Associates, Bethesda, MD), consisting of the S9 fraction of a liver homogenate prepared from Aroclor 1254-treated male Sprague-Dawley rats supplemented by appropriate cofactors. In addition to concurrent solvent (DMSO) controls, other cultures were treated with recognized strain-specific mutagens* as positive controls. The entire assay was performed twice.

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*For nonactivated strains: TA98, TA1538: 2-Nitrofluorene (2NF); TA100, TA1535, WP-2: N'-methyl-N-nitro-nitrosoguanidine (MNNG); TA1537: 9-aminoacridine (9-AAc).
For all activated strains: 2-aminoanthracine (2AAn).

After 48 hours incubation, the mean value of revertants per test plate at each dose level was compared to concurrent vehicle control. A positive assay is defined by this lab as a reproducible dose associated increase in the mean numbers of revertant colonies over at least three concentrations of the test material with at least one "positive" dose point (defined as a mean value equal to or greater than twice the concurrent vehicle control value).

E. Results - In no instance at any dose were mean revertant values for test article plates significantly increased over solvent controls (Report Tables 1 and 2 appended to this DER). In contrast, all positive controls responded as expected, with increased revertant counts ranging from 15 to 85 times solvent control values.

The author concluded that malathion was not mutagenic to the standard battery of Salmonella (Ames) strains nor to E. coli WP-2 in confirmatory testing at concentrations up to 5000 ug/plate.

F. TP Evaluation - ACCEPTABLE. This study was performed adequately, according to recognized criteria and controls, such that the negative result obtained is considered valid.

Attachments (Data Tables)

RIN 1244-00

Malathion Tox Review # 8032

Page_____ is not included in this copy.

Pages 6 through 10 are not included.

The material not included contains the following type of information:

_____ Identity of product inert ingredients.

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_____ Description of quality control procedures.

_____ Identity of the source of product ingredients.

_____ Sales or other commercial/financial information.

_____ A draft product label.

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