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ENVIRONMENT, SAFETY & HEALTH

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Attention: Section 8(e) Coordinator (CAP Agreement)

This submission is pursuant to the TSCA Section 8(e) Compliance Audit Program and CAP Agreement #8ECAP-0036. This information was inadvertently overlooked as we were assembling our final submission under CAP. This study has been added to the Monsanto final report for the CAP.

The information included is characterized as follows:

Chemical Identity: MCS 1980: polyphenyls, biphenyl-free
Chemical CAS No.: 68514818

Information/Study Type: (II,B,2,b)/Acute, Environmental

Title: Acute Toxicity of MCS 1980 to Daphnia magna
Study Identification #: MO-92-9045

Summary of reportable adverse effects: Submitted due to a high order of toxicity in an aquatic organism.

It should be noted that environmental effects were previously reported for this material under the CAP, as shown on Appendix A.

It should be noted that this summary may not highlight all adverse effects that EPA may judge to meet TSCA 8(e) reportability.

No information in this submission is trade secret or confidential business information.

Sincerely,

J.R. Condray
Director, Regulatory Management
(314) 694-8883

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12/7/94

APPENDIX A

Previous environmental effect submissions under #8ECAP-0036 for MCS 1980, CAS # 68514818

Chronic Toxicity of T75 to Daphnia (AB84X072)
Toxicity of T75 to Selenastrum (BN84X080)
Acute Toxicity of T75 to Mysid (BN84X084)
Acute Toxicity of T75 to Midge Larvae (BN84X111)
Acute Toxicity of T75 to Gammarids (XX929950)
Toxicity of T75 to Fathead Embryos, Larvae (XX929951)
Acute Toxicity of MCS-2067 to Daphnia (AB929968)
Acute Toxicity of MCS 1980 New to Daphnia (MO84X044)

(2)

MIC ENVIRONMENTAL SCIENCES
(CO./DIV./DEPT./LOCATION)

SPECIAL STUDY REPORT
(TYPE OF REPORT)

MO 92-9045

REPORT NO.: ES-82-SS-61

JOB/PROJECT NO.: 43-000-760.26-4222444

DATE: September 10, 1982

TITLE: ACUTE TOXICITY OF MCS 1980 TO DAPHNIA MAGNA

AUTHORS: C. Calvert and W. J. Adams

ABSTRACT: The acute toxicity of MCS 1980 to Daphnia magna was assessed at the MIC aquatic laboratory, during a 48-hour static test. The 48-hour EC50 value was 0.007 mg/L and the no effect level was observed to be <0.006 mg/L.

DISTRIBUTION:
W. J. Adams - N1B*
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*Raw data attached

REPT. NO.: ES-82-SS-61 AUTHORS: C. Calvert and W. J. Adams TITLE: ACUTE TOXICITY OF MCS 1980 TO DAPHNIA MAGNA

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ACUTE TOXICITY OF MCS 1980 TO DAPHNIA MAGNA

INTRODUCTION

The purpose of this study is to determine the acute toxicity of MCS 1980 to a common aquatic invertebrate Daphnia magna. The use of Daphnia magna as a representative aquatic species is viewed by the scientific community (Cairns et al., 1979) as a valid means of obtaining an estimate of the toxicity of a chemical to aquatic organisms. Toxicological information together with an estimate of environmental exposure concentration can be used to evaluate the potential environmental hazard of a chemical resulting from manufacture, use, and disposal.

SUMMARY

The acute toxicity of MCS 1980 to Daphnia magna was assessed at the MIC aquatic laboratory during a 48-hour static test. The 48-hour EC50 value is 0.007 mg/L and the no effect level was observed to be <0.006 mg/L.

MATERIALS AND METHODS

Procedures used in the acute toxicity test followed those described in the MIC Environmental Assessment Method for Conducting Acute Toxicity Tests with Daphnia magna (Grueber and Adams, 1980), and Methods for Acute Toxicity Tests With Fish, Macroinvertebrates and Amphibians (U.S. EPA, 1975). The Daphnia magna used in this test were cultured at the MIC aquatic laboratory and came from adults which were fed a trout chow solution and algae daily. Daphnids known to be less than 24 hours old were separated from the adults and used for this test. Nominal concentrations are reported as milligrams of test compound per liter of dilution water (mg/L). The chemical used in this test was obtained from R. H. Mills. All raw data pertaining to this study is contained in Appendix I and Monsanto notebook page 2033433. The test chemical, MCS 1980, was received in a 1 quart jar in good condition on 4/5/82. The lot number for this chemical is 1950221. The chemical has been labeled and logged in Monsanto notebook on page 1911898 and is stored in the Environmental Assessment Group chemical storage cabinet. The test was started and finished on 8/18/82 and 8/20/82.

The static toxicity test was conducted in 250 milliliter (mL) beakers which contained 200 mL of test solution. The dilution water used in this study was well water from St. Peters, Missouri. For each test concentration, the appropriate amount of the test compound, dissolved in dimethylformamide was pipetted into 1000 mL of dilution water and shaken vigorously for 1 minute. This solution was then divided into three 200 mL aliquots in triplicate beakers to provide appropriate replication. The remaining 400 mL were used for 0-hour DO, pH, alkalinity and hardness determinations. A control, consisting of the same dilution water and conditions but with no test compound was established. Also, a solvent control was employed which consisted of dilution water and the maximum amount of solvent used in the test concentrations. The amount of solvent used in this test was 0.5 mL dimethylformamide/L (DMF).

Nominal test concentrations were selected based on a rangefinding test (Appendix I). All test vessels were maintained at room temperature. Test solutions were not aerated during the test. Ten daphnids were randomly assigned to each test vessel within 30 minutes after the compound was added for a total of 30 daphnids per concentration.

During this test, the dissolved oxygen concentration, pH alkalinity and hardness, and temperature of test solutions were monitored at the initiation and termination of the toxicity test in the high, middle, low and control test concentrations. DO was measured by the Winkler titration method (SOP #EAS-80-SOP-006). The pH was measured with a Beckman pH meter (SOP #EAS-80-SOP-007). The total hardness and alkalinity determinations were conducted according to "Standard Methods for the Examination of Water and Wastewater" (1979), (SOPs #EAS-80-SOP-008 and #EAS-80-SOP-009). A complete analysis of the well water is presented in Table 1. All raw data for Table I is contained on notebook pages 1,889,925-1,889,927.

Test concentrations and corresponding percent mortality data derived from definitive tests were used to calculate the 48-hour median effect concentration, EC50, and 95% confidence intervals. The EC50 is defined as the calculated nominal concentration of the test compound in dilution water which causes 50% immobilization in the test animal population at the stated exposure interval.

In tests where the highest percentage was $\geq$65 percent, the computer program of Stephan (1978) which calculates an EC50 by three methods, binomial, moving average, and probit analysis, was used (Stephan, 1976). For tests in which the mortality did not exceed 50 percent, the EC50 is reported as greater than the highest test concentration. If the highest percentage kill was >50 <65 percent, the EC50 is estimated by the program of Stephan and is reported as an estimate.

RESULTS

During the 48-hour toxicity test with MCS 1980, the pH and dissolved oxygen ranged from 8.0 to 8.3 and 8.1 to 8.7 mg/L, respectively (Tables 2 and 3 and Appendix I). The average temperature was 22.2°C and the alkalinity and hardness ranged from 220 to 264 mg/L and 226 to 246 mg/L. A summary of the percent immobilization during this test is presented in Table 4.

Visual inspection of the beakers indicated that the water solubility was not exceeded at any concentration.

QUALITY ASSURANCE

All aspects of this study meet the recommended criteria for an acceptable test as specified in Grueber and Adams (1980). Both a control and a solvent control were used in this study. No mortality was observed in the control and only 3.3 percent in the solvent control.

Table 1. Average water quality characteristics of the dilution (well) water.

Characteristic	Well Water Measurement
Alkalinity (mg/L $CaCO_3$)	303
Hardness (mg/L $CaCo_3$)	297
pH (median)	8.10
Aluminum (mg/L Al)	0.023
Ammonia-total (mg/L N)	<0.05
Ammonia-unionized (mg/L NH_4)	<0.001
Barium (mg/L B)	0.045
Beryllium (mg/L Be)	~005
Cadmium (mg/L Cd)	<0.0001
Chromium (mg/L Cr)	0.055
Cobalt (mg/L Co)	0.005
Copper (mg/L Cu)	0.002
Iron (mg/L Fe)	0.008
Lead (mg/L Pb)	0.005
Nickel (mg/L Ni)	0.004
Organophosphates (ng/L)	
Diazinon	52
Disyston	50
Methyl Parathion	77
Malathion	140
Ethyl Parathion	110

Table 1. cont'd.

Characteristic	Well Water Measurement
Oragnochlorine (ng/L)	
HCB	<5
αBHC	<6
γBHC (Lindane)	<7
Heptachlor	<9
Aldrin	<10
Heptachlor Epoxide	<13
βChlordane	<15
αChlordane	<17
pp'-DDE	<19
Dieldrin	<22
Endrin	<39
op'-DDT	<43
pp'-DDD	<37
pp'-DDT	<48
Mirex	<74
Methoxychlor	<230
Silver (mg/L Ag)	<0.0001
Zinc (mg/L Zn)	0.085

Table 2. Temperature, Dissolved Oxygen Concentrations, pH, Alkalinity, and Hardness Measurements Taken During the 48-Hour Acute Test With

Measurement	Conc. (mg/L)	0-Hour	48-Hour
Temperature (°C)	Control	21.6	22.7
D.O. (mg/L)	Control	8.4	8.2
	Low	8.7	8.2
	Med	8.6	8.1
	High	8.3	8.0
pH	Control	8.0	8.2
	Low	8.0	8.3
	Med	8.0	8.3
	High	8.1	8.3
Alkalinity (mg/L)	Control	230	220
	Low	236	246
	Med	250	264
	High	240	244
Hardness (mg/L)	Control	246	246
	Low	236	236
	Med	232	226
	High	246	244

TABLE 3. Acute toxicity of MCS 1980 to Daphnia magna.

EC50 Values (mg/L)		No Effect Concentration at 48 Hours (mg/L)
24 Hours	48 Hours	
>0.1	0.007 (0.006-0.009)	<0.006

TABLE 4. Concentrations tested and corresponding percent immobilization of *Daphnia magna* exposed to MCS 1980.

Nominal Concentration (mg/L)	Percent Immobilization for Combined Replicates	
	24 Hours	48 Hours
Control	0	0
Solvent Control	0	3.3
0.006	0	33.3
0.012	0	86.7
0.025	10	100
0.05	10	100
0.1	50	96.7

LITERATURE CITED

American Society for Testing Materials. 1980. Standard Practice for Conducting Acute Toxicity Tests With Fishes, Macroinvertebrates, and Amphibians. ASTM Standard Practice Designation: E729-80.

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OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

FEB 27 1995

EPA acknowledges the receipt of information submitted by your organization under Section 8(e) of the Toxic Substances Control Act (TSCA). For your reference, copies of the first page(s) of your submission(s) are enclosed and display the TSCA §8(e) Document Control Number (e.g., 8EHQ-00-0000) assigned by EPA to your submission(s). Please cite the assigned 8(e) number when submitting follow-up or supplemental information and **refer to the reverse side of this page for "EPA Information Requests"** .

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EPA looks forward to continued cooperation with your organization in its ongoing efforts to evaluate and manage potential risks posed by chemicals to health and the environment.

Sincerely,

Terry R. O'Bryan

Terry R. O'Bryan
Risk Analysis Branch

Enclosure 12072A

Triage of 8(e) Submissions

Date sent to triage: MAR 0 8 1995

Submission number: 12072A

NON-CAP CAP

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Study type (circle appropriate):

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0502 INFO REQUESTED (TECH)
0503 INFO REQUESTED (VOL ACTIONS)
0504 INFO REQUESTED (REPORTING RATIONALE)

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0404 LABEL/MSDS CHANGES
0405 PROCESS/HANDLING CHANGES
0406 APP./USE DISCONTINUED
0407 PRODUCTION DISCONTINUED
0408 CONFIDENTIAL

SUB. DATE: 11/25/92 [redacted] 12/02/92 CSRAD DATE: 12/07/94

CHEMICAL NAME:
MCS 1980

CAS#
68514-81-8

INFORMATION TYPE:		P F C
0201	ONCO (HUMAN)	01 02 04
0202	ONCO (ANIMAL)	01 02 04
0203	CELL. TRANS (IN VITRO)	01 02 04
0204	MUTA (IN VITRO)	01 02 04
0205	MUTA (IN VIVO)	01 02 04
0206	REPRO/TERATO (HUMAN)	01 02 04
0207	REPRO/TERATO (ANIMAL)	01 02 04
0208	NEURO (HUMAN)	01 02 04
0209	NEURO (ANIMAL)	01 02 04
0210	ACUTE TOX. (HUMAN)	01 02 04
0211	CHR. TOX. (HUMAN)	01 02 04
0212	ACUTE TOX. (ANIMAL)	01 02 04
0213	SUB ACUTE TOX (ANIMAL)	01 02 04
0214	SUB CHRONIC TOX (ANIMAL)	01 02 04
0215	CHRONIC TOX (ANIMAL)	01 02 04

INFORMATION TYPE:		P F C
0216	EPI/CLIN	01 02 04
0217	HUMAN EXPOS (PROD CONTAM)	01 02 04
0218	HUMAN EXPOS (ACCIDENTAL)	01 02 04
0219	HUMAN EXPOS (MONITORING)	01 02 04
(0220)	ECO/AQUA TOX	01 (02) 04
0221	ENV. OCCC/REL/FATE	01 02 04
0222	EMER INCI OF ENV CONTAM	01 02 04
0223	RESPONSE REQEST DELAY	01 02 04
0224	PROD/COMP/CHEM ID	01 02 04
0225	REPORTING RATIONALE	01 02 04
0226	CONFIDENTIAL	01 02 04
0227	ALLERG (HUMAN)	01 02 04
0228	ALLERG (ANIMAL)	01 02 04
0239	METAB/PHARMACO (ANIMAL)	01 02 04
0240	METAB/PHARMACO (HUMAN)	01 02 04

INFORMATION TYPE:		P F C
0241	IMMUNO (ANIMAL)	01 02 04
0242	IMMUNO (HUMAN)	01 02 04
0243	CHEM/PHYS PROP	01 02 04
0244	CLASTO (IN VITRO)	01 02 04
0245	CLASTO (ANIMAL)	01 02 04
0246	CLASTO (HUMAN)	01 02 04
0247	DNA DAM/REPAIR	01 02 04
0248	PROD/USE/PROC	01 02 04
0251	MSDS	01 02 04
0299	OTHER	01 02 04

TRIAGE DATA: NON-CBI INVENTORY
(YES)
CAS SR NO
[redacted]

ONGOING REVIEW
YES (DROP/REFER)
NO (CONTINUE)
[redacted]

SPECIES
Daphnia Magna

TOXICOLOGICAL CONCERN:
LOW
MED
HIGH

USE:

PRODUCTION:

[redacted]