

CAS# 128-04-1  
Carbamodithioic acid, dimethyl-, sodium salt

201-14930B

Molecular Formula:  $C_3H_7NS_2 \cdot Na$   
Molecular Weight: 144.2

1.1 GENERAL SUBSTANCE INFORMATION

A. **Type of Substance:** Organic  
B. **Physical State:** Yellow liquid  
C. **Purity:** Typically 40% w/w as aqueous solution

1.2 SYNONYMS Methyl Namate®  
SDMC  
SDDC  
Aquatreat® SDM  
Perkacit® SDMC

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PHYSICAL-CHEMICAL DATA

\*2.1 **MELTING POINT**

Value: 110° C (isolated solid)  
Decomposition: No  
Sublimation: No  
Method: Differential Scanning Calorimetry  
GLP: Yes  
Remarks:  
Reference: R. T. Vanderbilt study; Baron Consulting, 1990  
Reliability: (1) Valid without restriction

\*2.2 **BOILING POINT**

Value: 102° C (32% aqueous solution)  
Pressure: 1 Atmosphere  
Decomposition: No data  
Method: No data  
GLP: Yes  
Remarks:  
Reference: R. T. Vanderbilt study; Baron Consulting, 1990  
Reliability: (1) Valid without restriction

†2.3 **DENSITY (relative density)**

Type: Density  
Value: 1.14 (32% aqueous solution)  
1.43 (isolated solid)  
Temperature: 20° C  
Method: No data  
GLP: Yes  
Remarks:  
Reference: R. T. Vanderbilt study; Baron Consulting, 1990  
Reliability: (1) Valid without restriction

\*2.4 **VAPOUR PRESSURE**

Value: 3.7 x 10<sup>-8</sup> mm Hg  
Temperature: 25° C  
Method: calculated  
Other: Modified Grain method  
GLP: No  
Remarks: Estimation method based on molecular structure and measured melting point value.  
Reference: EPIWIN/MPBPWIN v1.40  
Reliability: (2) Valid with restrictions – modelling data

**\*2.5 PARTITION COEFFICIENT log<sub>10</sub>P<sub>ow</sub>**

Log Pow: -2.41  
Temperature: None  
Method: calculated  
Other: SRC LogKow (KowWin) Program 1995  
GLP: No  
Remarks: Estimation method based on molecular structure and measured melting point value.  
Reference: EPIWIN/KOWWIN v1.66  
Reliability: (2) Valid with restrictions – modelling data

**\*2.6 WATER SOLUBILITY**

**A. Solubility**

Value: miscible  
Temperature: 20° C  
Method: No data  
GLP: Yes  
Remarks:  
Reference: R. T. Vanderbilt study; Baron Consulting, 1990  
Reliability: (1) Valid without restriction

**B. pH Value, pKa Value**

pH Value: 10.1 (1% aqueous solution)  
12.6 (32% aqueous solution)  
pKa value: Not applicable; product decomposes below pH 8.

**2.11 OXIDIZING PROPERTIES**

**†2.12 OXIDATION: REDUCTION POTENTIAL**

**2.13 ADDITIONAL DATA**

**A. Partition co-efficient between soil/sediment and water (Kd)**

**B. Other data – Henry's Law Constant**

Results: 6.972 x 10<sup>-15</sup> atm-m<sup>3</sup>/mole  
Remarks: Calculated value from moist soil surfaces. Estimation method based on molecular structure and measured melting point value.  
Reference: Environ Toxicol Chem 10: 1283-93 (1991)  
EPIWIN/HENRYWIN v3.10  
Reliability: (2) Valid with restrictions – modelling data

### 3. ENVIRONMENTAL FATE AND PATHWAYS

#### \*3.1.1 PHOTODEGRADATION

Type: Air  
Light source: Sunlight  
Temperature: 25°C  
Direct photolysis:  
Half life: 0.925 hours  
Indirect Photolysis:  
Rate constant (radical):  $68.5296 \times 10^{-12} \text{ cm}^3/\text{molecule-sec}$   
Method: calculated  
Atmospheric Oxidation Program/SAR Methods, 1995  
GLP: No  
Test substance: Other: SAR  
Remarks: Half-life estimated to be 0.156 days (12-hr day,  $1.5 \times 10^6 \text{ OH/cm}^3$ ) or 1.873 hours. Estimation method based on molecular structure and measured melting point value.  
Reference: Meylan, WH and Howard, PH, Chemosphere 26: 1193-99, 1999  
EPIWIN/AOPWIN v1.90  
Reliability: (2) Valid with restrictions – modelling data

#### \*3.1.2 STABILITY IN WATER

Type: Hydrolysis as a function of pH  
Media: Water buffered to pH 5, 7 and 9  
Method: OPPTS 835.2110  
Results: estimated half life:  
pH 5.0: 0.30 hr (18 min)  
pH 7.0: 25.9 hr (1,555 min)  
pH 9.0: 433.3 hr (25,997 min)  
Remarks: Additional study information is confidential and compensable under FIFRA.  
Reference: Alco Chemical Division, National Starch and Chemical Company; Hazleton Laboratories America, 1987  
Reliability: (1) Valid without restrictions

Type: Volatility  
Media: Water  
Method: Estimation Method, 1990  
Results: Volatilization half-life from model river:  $1.15 \times 10^7$  years  
Volatilization half-life from model lake:  $1.25 \times 10^8$  years  
Remarks: Model river = 1 m deep flowing at 1 m/sec and wind velocity of 5 m/sec. Model lake = 1 m deep flowing at 0.05 m/sec and wind velocity of 0.5 m/sec.  
Reference: Alco Chemical Division, National Starch and Chemical Company; Hazleton Laboratories America, 1987  
Reliability: (2) Valid with restrictions – modelling data

### \*3.2 MONITORING DATA (ENVIRONMENTAL)

### 3.3 TRANSPORT AND DISTRIBUTION BETWEEN ENVIRONMENTAL COMPARTMENTS INCLUDING ESTIMATED ENVIRONMENTAL CONCENTRATIONS AND DISTRIBUTION PATHWAYS

#### \*3.3.1 TRANSPORT

Type: Adsorption/desorption  
Media: Soil/Sediment  
Method: OPPTS 835.1230  
Results:

Adsorption coefficients (Kd):

sandy loam: 5.99  
silt loam: 12.6  
silty clay loam: 6.47  
sand: 1.45

Desorption:

sandy loam: 0 – 19.7%  
silt loam: 8.6 – 17.8%  
silty clay loam: 1.1 – 21.9%

Remarks: Additional study information is confidential and compensable under FIFRA

Reference: Alco Chemical Division, National Starch and Chemical Company; Hazleton Laboratories America, 1986

Reliability: (1) Valid without restrictions

Type: Volatility  
Media: Water  
Method: Estimation Method, 1990

Results: Volatilization half-life from model river:  $1.15 \times 10^7$  years  
Volatilization half-life from model lake:  $1.25 \times 10^8$  years

Remarks: Model river = 1 m deep flowing at 1 m/sec and wind velocity of 5 m/sec. Model lake = 1 m deep flowing at 0.05 m/sec and wind velocity of 0.5 m/sec. Estimation method based on molecular structure and measured melting point value.

Reference: Handbook of Chemical Property Estimation Methods, 1990

Reliability: (2) Valid with restrictions – modelling data

#### \*3.3.2 THEORETICAL DISTRIBUTION (FUGACITY CALCULATION)

Media: Air-biota-sediment-soil-water  
Method: Fugacity level III  
EPIWIN v3.10

Results:	Mass Amount (%)	Half-life (hrs)	Emissions (kg/hr)
Air	$1.02 \times 10^{-6}$	3.75	1000
Water	45.3	360	1000
Soil	54.6	360	1000
Sediment	0.0755	1440	0

Remarks: Persistence time estimated at 421 hours. Estimation method based on molecular structure and measured melting point value.  
Reference: EPISUITE/EPIWIN v3.10  
Reliability: (2) Valid with restrictions – modelling data

### **\*3.5 BIODEGRADATION**

Species: None  
Exposure Period: 96 days  
Temperature: 25° C  
Concentration: 9.2 ppm  
Method: OPPTS 835.4400  
Type of test: Anaerobic degradation  
GLP: Yes  
Test substance: <sup>14</sup>C-labelled SDMC  
Remarks: Tetramethyl thiuram disulfide, tetramethyl thiuram monosulfide were the major decomposition products. Additional study information is confidential and compensable under FIFRA.  
Reference: Alco Chemical Division, National Starch and Chemical Company; Hazleton Laboratories America, 1987  
Reliability: (1) Valid without restrictions

### **3.6 BOD5, COD OR RATIO BOD5/COD**

### **3.7 BIOACCUMULATION**

Species: None  
Exposure Period: None  
Temperature: None  
Concentration: None  
BCF: 0.5 (estimated)  
Elimination:  
Method: Calculated  
Type of test:  
GLP: No  
Test substance:  
Remarks:  
Reference: EPISUITE/EPIWIN BCF Program v2.14  
Reliability: (2) Valid with restrictions – modelling data

## **4. ECOTOXICITY**

### **\*4.1 ACUTE TOXICITY TO FISH**

Type of test: Flow-through  
Species: *Cyprinodon variegatus* (Sheepshead minnow)  
Exposure period: 96 hours  
Results: LC<sub>50</sub> (24h) = 107 mg/l  
LC<sub>50</sub> (48h) = 63.0 mg/l  
LC<sub>50</sub> (72h) = 60.1 mg/l

LC<sub>50</sub> (96h) = 60.1 mg/l  
NOEC = 23.9 mg/l

Analytical monitoring: Yes  
Method: FIFRA 72-3  
GLP: Yes  
Test substance: As prescribed by 1.1-1.4, purity 48.27% w/v  
Remarks: Additional study information is confidential and compensable under FIFRA.  
Reference: Alco Chemical Division, National Starch and Chemical Company; Toxikon Environmental Sciences  
Reliability: (1) Valid without restriction

Type of test: Flow-through  
Species: *Oncorhynchus mykiss* (Rainbow trout)  
Exposure period: 96 hours  
Results: LC<sub>50</sub> (24h) = 32.2 mg/l  
LC<sub>50</sub> (48h) = 7.12 mg/l  
LC<sub>50</sub> (72h) = 6.69 mg/l  
LC<sub>50</sub> (96h) = 6.69 mg/l  
NOEC < 3.66 mg/l

Analytical monitoring: Yes  
Method: FIFRA 72-1  
GLP: Yes  
Test substance: As prescribed by 1.1-1.4, purity 48.27% w/v  
Remarks: Additional study information is confidential and compensable under FIFRA.  
Reference: Alco Chemical Division, National Starch and Chemical Company; Toxikon Environmental Sciences (03/10/1992)  
Reliability: (1) Valid without restriction

Type of test: Static  
Species: *Salmo gairdneri* (*Oncorhynchus mykiss*, rainbow trout)  
Exposure period: 96 hours  
Results: LC<sub>50</sub> (24h) = 7.6 mg/l  
LC<sub>50</sub> (48h) = 1.5 mg/l  
LC<sub>50</sub> (96h) = 0.85 mg/l  
NOEC 0.3 mg/l

Analytical monitoring: Not reported  
Method: EPA OPPTS 40 CFR 850.1075  
GLP: Yes  
Test substance: Aquatreat SDM, SDMC 40%  
Remarks: Additional study information is confidential and compensable under FIFRA.  
Reference: Alco Chemical Division, National Starch and Chemical Company; Analytical Bio-Chemistry Laboratories, Inc. (1985)  
Reliability: (1) Valid without restriction

Type of test: Static  
Species: *Lepomis macrochirus* (Bluegill)  
Exposure period: 96 hours  
Results: LC<sub>50</sub> (24h) = 23 mg/l  
LC<sub>50</sub> (48h) = 4.0 mg/l  
LC<sub>50</sub> (96h) = 3.3 mg/l

NOEC < 0.6 mg/l

Analytical monitoring: Yes

Method: EPA OPPTS 40 CFR 850.1075

GLP: Yes

Test substance: Aquatreat SDM, SDMC 40%

Remarks: Additional study information is confidential and compensable under FIFRA.

Reference: Alco Chemical Division, National Starch and Chemical Company; Analytical Bio-Chemistry Laboratories, Inc. (1985)

Reliability: (1) Valid without restriction

  

Type of test: Flow-through

Species: *Lepomis macrochirus* (Bluegill)

Exposure period: 96 hours

Results: LC<sub>50</sub> (96h) = 38.5 mg/l  
NOEC = 6.40 mg/l

Analytical monitoring: Yes

Method: FIFRA 72-1

GLP: Yes

Test substance: Aquatreat SDM, purity 47.75% w/v (40.47% SDMC w/w)

Remarks: Additional study information is confidential and compensable under FIFRA.

Reference: Alco Chemical Division, National Starch and Chemical Company; Toxikon Environmental Sciences (03/10/1992)

Reliability: (1) Valid without restriction

## 4.2 ACUTE TOXICITY TO AQUATIC INVERTEBRATES

**\*A. Daphnia**

Type of test: Flow-through

Species: *Daphnia magna*

Exposure period: 48 hours

Results: EC<sub>50</sub> (48h) = 0.0715 mg/l  
NOEC = 0.0104 mg/l

Analytical monitoring: Yes

Method: FIFRA 77-2

GLP: Yes

Test substance: As prescribed by 1.1-1.4, purity 40.47% w/w

Remarks: Additional study information is confidential and compensable under FIFRA.

Reference: Alco Chemical Division, National Starch and Chemical Company; Toxikon Environmental Sciences 10/02/1992

Reliability: (1) Valid without restriction

  

Type of test: Static

Species: *Daphnia magna*

Exposure period: 48 hours

Results: EC<sub>50</sub> (48h) = 0.0715 mg/l  
NOEC = 0.0104 mg/l

Analytical monitoring: Yes

Method: FIFRA 77-2

GLP: Yes

Test substance: As prescribed by 1.1-1.4, purity 40.47% w/w  
Remarks: Additional study information is confidential and compensable under FIFRA.  
Reference: Alco Chemical Division, National Starch and Chemical Company; Toxikon Environmental Sciences 10/02/1992  
Reliability: (1) Valid without restriction

Type of test: Static  
Species: *Daphnia magna*  
Exposure period: 48 hours  
Results: LC<sub>50</sub> (48h) = 1.5 mg/l  
NOEC < 0.18 mg/l

Analytical monitoring: Yes  
Method: OPPTS 850.1010  
GLP: Yes  
Test substance: As prescribed by 1.1, purity 40% w/w  
Remarks: Additional study information is confidential and compensable under FIFRA.  
Reference: Alco Chemical Division, National Starch and Chemical Company; Analytical Bio-chemistry Laboratories, Inc., 1985  
Reliability: (1) Valid without restriction

Type of test: Static  
Species: *Mysidopsis bahia*  
Exposure period: 96 hours  
Results: LC<sub>50</sub> (96h) = 2.7 µg/l  
NOEC = 0.64 µg/l

Analytical monitoring: Yes  
Method: OPPTS 850.1055  
GLP: Yes  
Test substance: As prescribed by 1.1, purity 40% w/w  
Remarks: Additional study information is confidential and compensable under FIFRA.  
Reference: Alco Chemical Division, National Starch and Chemical Company; Springborn Bionomics, Inc., 1987  
Reliability: (1) Valid without restriction

#### **\*4.3 TOXICITY TO AQUATIC PLANTS, e.g. algae**

Type of test: Static  
Species: *Chorella pyrenoidosa*  
Exposure period: 96 hours  
Results: EC<sub>50</sub> (96h) = 0.8 mg/l  
Analytical monitoring: No data  
Method: OECD 201  
GLP: No data  
Test substance: As prescribed by 1.1, purity 40% w/w  
Remarks: None  
Reference: Van Leeuwen, C.J., Ecotoxicological Aspects of Dithiocarbamates. Rijkswaterstaat, Publication No. 44/1986  
Reliability: (1) Valid without restriction

**\*4.4 TOXICITY TO MICROORGANISMS, e.g. bacteria**

**\*4.5 CHRONIC TOXICITY TO AQUATIC ORGANISMS**

Type of test: Flow-through  
Species: *Daphnia magna*  
Exposure period: 48 hours  
Results: EC<sub>50</sub> (48h) = 0.0715 mg/l  
NOEC = 0.0104 mg/l  
Analytical monitoring: Yes  
Method: FIFRA 77-2  
GLP: Yes  
Test substance: As prescribed by 1.1-1.4, purity 40.47% w/w  
Remarks: Additional study information is confidential and compensable under FIFRA.  
Reference: Alco Chemical Division, National Starch and Chemical Company; Toxikon Environmental Sciences 10/02/1992  
Reliability: (1) Valid without restriction

**4.5.1 CHRONIC TOXICITY TO FISH**

**4.5.2 CHRONIC TOXICITY TO AQUATIC INVERTEBRATES**

Type of test: Flow-through  
Species: *Daphnia magna*  
Exposure period: 21 days  
Results: EC<sub>50</sub> (48h) = 0.0715 mg/l  
NOEC = 0.0104 mg/l  
Analytical monitoring: Yes  
Method: Other; laboratory-developed method based on EPA, OECD and ASTM guidelines  
GLP: Yes  
Test substance: As prescribed by 1.1, purity 40% w/w  
Remarks: Tested at 0, 0.009, 0.021, 0.048, 0.080 and 0.19 mg/l. Survival and length were significantly reduced at 0.021 mg/l and higher. Additional study information is confidential and compensable under FIFRA.  
Reference: Alco Chemical Division, National Starch and Chemical Company; Analytical Bio-Chemistry Laboratories, Inc. (1985)  
Reliability: (1) Valid without restriction

**5. TOXICITY**

**\*5.1 ACUTE TOXICITY**

**5.1.1 ACUTE ORAL TOXICITY**

Type: LD<sub>50</sub>  
Species/strain: Rats, Sprague-Dawley  
Value: 3929 mg/kg bw  
Discriminating dose: 1850 mg/kg bw

Sex: Male/female  
# of Animals: Five per sex per group  
Vehicle: None  
Doses: 1850, 2500, 3500 and 5000 mg/kg bw  
Method: FIFRA 81-1  
GLP: Yes  
Test substance: Vancide® 51 (27.6% SDMC, 2.4% SMBT aqueous solution, pH 11.6).  
Remarks: Additional study information is confidential and compensable under FIFRA.  
Reference: R. T. Vanderbilt study; Springborn Laboratories, 1973  
Reliability: (1) Valid without restrictions.

### 5.1.2 ACUTE INHALATION TOXICITY

Type: Limit test  
Species/strain: Rats, Sprague-Dawley  
Value: > 2.05 mg/l  
Sex: Male/female  
# of Animals: Five per sex per group  
Vehicle: None  
Doses: 2.05 mg/l for four hours  
Method: FIFRA 81-3  
GLP: Yes  
Test substance: Vancide® 51 (27.6% SDMC, 2.4% SMBT aqueous solution, pH 11.6).  
Remarks: Additional study information is confidential and compensable under FIFRA.  
Reference: R. T. Vanderbilt study; Springborn Laboratories, 1973  
Reliability: (1) Valid without restrictions.

### 5.1.3 ACUTE DERMAL TOXICITY

Type: Limit test  
Species/strain: Rabbits, New Zealand Albino  
Sex: Male/female  
# of Animals: Five per sex  
Vehicle: None  
Doses: 2000 mg/kg bw  
Exposure Time: 24 Hours  
Value: >2000 mg/kg bw  
Method: FIFRA 81-2  
GLP: Yes  
Test substance: Vancide® 51 (27.6% SDMC, 2.4% SMBT aqueous solution, pH 11.6)  
Remarks: No animals died during the study. The dermal LD50 is greater than 2000 mg/kg.  
Reference: R. T. Vanderbilt Study; Springborn Laboratories 1995  
Reliability: (1) Valid without restrictions

## 5.2 CORROSIVENESS/IRRITATION

## 5.2.1 SKIN IRRITATION/CORROSION

Species/strain: Rabbits, New Zealand Albino  
Sex: Male/female  
# of Animals: Six  
Exposure time: Four hours  
Results: Slightly irritating  
Classification: Not irritating  
Method: FIFRA 81-5  
GLP: Yes  
Test substance: Vancide® 51 (27.6% SDMC, 2.4% SMBT aqueous solution, pH 11.6)  
Remarks: 0.5 ml of the test substance was applied to the shaved skin of six albino rabbits for four hours. The mean Primary Irritation Index was 1.67. Additional study information is confidential and compensable under FIFRA.  
Reference: R. T. Vanderbilt Study, Springborn Laboratories 1995  
Reliability: (1) Valid without restrictions

Species/strain: Rabbits, New Zealand Albino  
Sex: Male/female  
# of Animals: Six  
Exposure time: Four hours  
Results: Slightly irritating  
Classification: Not irritating  
Method: FIFRA 81-5  
GLP: Yes  
Test substance: Aquatreat SDM, 39.7% SDMC aqueous solution, pH 13.0)  
Remarks: 0.5 ml of the test substance was applied to the shaved skin of six albino rabbits for four hours. The Primary Irritation Index was 1.0. Additional study information is confidential and compensable under FIFRA.  
Reference: Alco Chemical Division, National Starch and Chemical Company; Stillmeadow Incorporated, 1995  
Reliability: (1) Valid without restrictions

Species/strain: Rabbits, New Zealand Albino  
Sex: Male/female  
# of Animals: Six  
Exposure time: Four hours  
Results: Slightly irritating  
Classification: Not irritating  
Method: FIFRA 81-5  
GLP: Yes  
Test substance: Aquatreat SDM, 39.7% SDMC aqueous solution, pH 13.0)  
Remarks: 0.5 ml of the test substance was applied to the shaved skin of six albino rabbits for four hours. The Primary Irritation Index was 1.2. Additional study information is confidential and compensable under FIFRA.  
Reference: Alco Chemical Division, National Starch and Chemical Company; Hazleton Laboratories America, Incorporated, 1986  
Reliability: (1) Valid without restrictions

## 5.2.2 EYE IRRITATION/CORROSION

Species/Strain: Rabbits, New Zealand Albino  
Sex: Male/female  
# of Animals: Nine  
Results: Slightly irritating  
Classification: Not irritating  
Method: FIFRA 81-4  
GLP: Yes  
Test substance: Vancide® 51 (27.6% SDMC, 2.4% SMBT aqueous solution, pH 11.6)  
Remarks: 0.1 ml of the test substance was applied to the eyes of nine albino rabbits; after 30 seconds, the eyes of three animals were washed with physiological saline. Irritation and corneal involvement was noted for up to 7 days; washing reduced the duration of the irritation. Additional study information is confidential and compensable under FIFRA.  
Reference: R. T. Vanderbilt Study, Springborn Laboratories 1995  
Reliability: (1) Valid without restrictions

Species/Strain: Rabbits, New Zealand Albino  
Sex: Male/female  
# of Animals: Nine  
Results: Mild to moderate irritation  
Classification: Irritant  
Method: FIFRA 81-4  
GLP: Yes  
Test substance: Aquatreat NM  
Remarks: 0.1 ml of the test substance was applied to the eyes of nine albino rabbits; after 30 seconds, the eyes of three animals were washed with physiological saline. Conjunctival irritation and corneal involvement was noted in two of six unwashed eyes for up to 21 days; washing did not appear to reduce the degree or duration of the irritation. Additional study information is confidential and compensable under FIFRA.  
Reference: Alco Chemical Division, National Starch and Chemical Company; Biosearch Incorporated, 1983  
Reliability: (1) Valid without restrictions

## \*5.4 REPEATED DOSE TOXICITY

Species/strain: Rats, Sprague-Dawley  
Sex: Male/Female  
Route of Administration: Aqueous gavage  
Exposure period: 13 Weeks  
Frequency of treatment: Consecutive days  
Post exposure observation period: No data  
Dose: 0, 0.5, 5 or 250 mg/kg bw  
Control group: Yes , concurrent vehicle  
NOEL: Not Determined  
LOEL: 5 mg/kg bw

Results: Administration of the test substance resulted in no functional or structural neurotoxicity. Additional study information is confidential and compensable under FIFRA.  
Method: FIFRA 82-7  
GLP: Yes  
Test substance: Aquatreat SDM  
Reference: SDDC/KDDC Task Force study; WIL Research Laboratories, Inc, 1/18/1995  
Reliability: (1) Valid without restrictions

Species/strain: Rabbit, New Zealand White  
Sex: Male/Female  
Route of Administration: Dermal  
Exposure period: 90 days  
Frequency of treatment: Once per day, five days per week, thirteen weeks  
Post exposure observation period: none  
Dose: 0, 50, 150, 300 mg/kg/day as supplied (0, 20, 60, 120 mg/kg/day as SDMC)  
Control group: Yes, concurrent untreated  
NOEL: 50 mg/kg/day as supplied (20 mg/kg/day as SDMC)  
LOEL: 150 mg/kg/day as supplied (60 mg/kg/day as SDMC)  
Results: Dermal irritation was observed at dosing site in mid- and high-dose group animals. There was no histologic evidence of systemic toxicity in any group of animals. White blood cell and platelet count were reduced at the high dose level. Additional study information is confidential and compensable under FIFRA.  
Method: FIFRA 82-3  
GLP: Yes  
Test substance: Aquatreat SDM sodium dimethyldithiocarbamate 40% aqueous solution  
Reference: Alco Chemical Division, National Starch and Chemical Company; Exxon Biomedical Sciences Incorporated, 1986  
Reliability: (1) Valid without restrictions

Species/strain: Rabbit, New Zealand White  
Sex: Male/Female  
Route of Administration: Dermal  
Exposure period: 90 days  
Frequency of treatment: Once per day, five days per week, thirteen weeks  
Post exposure observation period: none  
Dose: 0, 50, 150, 300 mg/kg/day as supplied (0, 20, 60, 120 mg/kg/day as SDMC)  
Control group: Yes, concurrent untreated  
NOEL: 50 mg/kg/day as supplied (20 mg/kg/day as SDMC)  
LOEL: 150 mg/kg/day as supplied (60 mg/kg/day as SDMC)  
Results: Dermal irritation was observed at dosing site in mid- and high-dose group animals. There was no histologic evidence of systemic toxicity in any group of animals. White blood cell and platelet count were reduced at the high dose level. Additional study information is confidential and compensable under FIFRA.

Method: FIFRA 82-3  
GLP: Yes  
Test substance: Aquatreat SDM sodium dimethyldithiocarbamate 40% aqueous solution  
Reference: Alco Chemical Division, National Starch and Chemical Company; Exxon Biomedical Sciences Incorporated, 1986  
Reliability: (1) Valid without restrictions

## \*5.5 GENETIC TOXICITY IN VITRO

### A. BACTERIAL TEST

Type: Ames  
System of testing: *Salmonella typhimurium*, strains TA98, TA100, TA 1535, TA 1537, TA 1538  
Concentration: Without Activation: 3333 mg/plate  
With Activation: 3333 mg/plate  
Metabolic activation: With and without  
Results:  
Cytotoxicity conc: With metabolic activation: 6667 mg/plate  
Without metabolic activation: 667 mg/plate  
Precipitation conc: > 6667 mg/plate  
Genotoxic effects:  
With metabolic activation: positive in strains TA100, TA 1535 and TA 1537  
Without metabolic activation: positive in strains TA100, TA 1535 and TA 1537  
Method: OPPTS 870.5100  
GLP: Yes  
Test substance: Aquatreat SDM (40% SDDC in water)  
Remarks: Additional study information is confidential and compensable under FIFRA.  
Reference: Alco Chemical Division, National Starch and Chemical Company; Microbiological Associates, Inc., 1986  
Reliability: (1) Acceptable without restrictions

### B. NON-BACTERIAL IN VITRO TEST

Type: Unscheduled DNA Synthesis Assay  
Species/strain: Rats, Sprague-Dawley  
Concentration: 0, 0.5, 1.0, 2.0, 3.0, 4.0, 5.0 and 6.0 µg/ml  
Control group: Yes; Positive Control (2-AAF), negative control and solvent control (EtOH)  
Results:  
Cytotoxicity conc: 2.0 µg/ml  
Precipitation conc: > 6.0 µg/ml  
Genotoxic effects: None at any dose tested.  
Method: OPPTS 870.5550  
GLP: Yes  
Test substance: Aquatreat SDM (40% SDMC)

Remarks: The test substance was considered to be not active in the Rat UDS Assay. Additional study information is confidential and compensable under FIFRA.

Reference: Alco Chemical Division, National Starch and Chemical Company; SITEK Research Laboratories, 1993

Reliability: (1) Valid without restriction

## \*5.6 GENETIC TOXICITY IN VIVO

### 5.7 CARCINOGENICITY

Species/strain: Rats, Fischer 344

Sex: Male/Female

Route of Administration: dietary admixture

Exposure period: 104 weeks starting when rats were six weeks old

Frequency of treatment: Daily, seven days/week

Number of animals: 50 per sex per group

Post exposure observation period: No data

Dose: 0, 1250, 2500 ppm in diet  
(approximately 0, 62.5 or 125 mg/kg bw)

Control group: Sixteen untreated males, 20 untreated females

NOEL: Not Determined

LOEL: Not Determined

Results: Groups of 50 rats of each sex were administered sodium diethyldithiocarbamate at one of two doses, either 1,250 or 2,500 ppm, for 104 weeks. Matched controls consisted of 16 untreated male rats and 20 untreated female rats. All surviving rats were killed at the end of administration of the test chemical.

Mean body weights of all dosed groups of rats and mice were lower than those of corresponding controls and were dose related throughout the bioassay except those of the low-dose male rats, which were essentially unaffected by administration of the test chemical. Survival of the rats was unaffected, and no other clinical signs could be related to administration of the test chemical; thus, the animals may have been able to tolerate higher doses. Sufficient numbers of dosed and control animals of each sex were at risk for the development of late-appearing tumors.

No tumors occurred in the rats or mice of either sex at incidences that were significantly higher in the dosed groups than in the control groups. It is concluded that under the conditions of this bioassay, sodium diethyldithiocarbamate was not carcinogenic for F344 rats of either sex.

Method: National Cancer Institute Protocol

GLP: Not specified

Test substance: Sodium diethyldithiocarbamate (CAS 148-18-5)

Reference: National Cancer Institute Carcinogenicity Technical Report Serial number 172, 1979. The complete study report is

available at <http://ntp-server.niehs.nih.gov/htdocs/LT-studies/tr172.html>.

Reliability: (2) Valid with restrictions; only two dose levels used, GLP status unknown.

Species/strain: Mouse, B6C3F1  
Sex: Male/Female  
Route of Administration: Dietary admixture  
Exposure period: 108 - 109 weeks starting when mice were six weeks old  
Frequency of treatment: Daily, seven days/week  
Number of animals: 50 per sex per group  
Post exposure observation period: No data  
Dose: 0, 500, 4000 ppm in diet  
Control group: Twenty (20) untreated mice of each sex  
NOEL: Not Determined  
LOEL: Not Determined  
Results: Groups of 50 mice of each sex were administered sodium diethyldithiocarbamate at one of two doses, either 500 or 4,000 ppm, for 108 or 109 weeks. Matched controls consisted of 20 untreated mice of each sex. All surviving mice were killed at the end of administration of the test chemical.  
Mean body weights of all dosed groups of mice were lower than those of corresponding controls and were dose related throughout the bioassay. Survival of the mice was unaffected, and no other clinical signs could be related to administration of the test chemical; thus, the animals may have been able to tolerate higher doses. Sufficient numbers of dosed and control animals of each species and sex were at risk for the development of late-appearing tumors.  
No tumors occurred in mice of either sex at incidences that were significantly higher in the dosed groups than in the control groups. It is concluded that under the conditions of this bioassay, sodium diethyldithiocarbamate was not carcinogenic for B6C3F<sub>1</sub> mice of either sex.

Method: National Cancer Institute Protocol

GLP: Not specified  
Test substance: Sodium diethyldithiocarbamate (CAS 148-18-5)  
Reference: National Cancer Institute Carcinogenicity Technical Report Serial number 172, 1979. The complete study report is available at <http://ntp-server.niehs.nih.gov/htdocs/LT-studies/tr172.html>.

Reliability: (2) Valid with restrictions; only two dose levels used, GLP status unknown.

Species/strain: Mouse, C57BL/6 and C3H/Anf  
Sex: Male/Female  
Route of Administration: Oral intubation for three weeks, then dietary admixture for 17 months  
Exposure period: Eighteen months starting when mice were seven days old

Frequency of treatment: Daily, seven days/week  
Number of animals: Eighteen per sex per strain  
Post exposure observation period: No data  
Dose: 560 ppm in diet (approximately 215 mg/kg)  
Control group: positive and negative (vehicle only)  
NOEL: Not Determined  
LOEL: Not Determined  
Results: The maximum tolerated dose for testing was determined by a sequence of studies during which the maximal levels resulting in no mortality was determined for a single dose, for six daily doses, and then for nineteen daily doses. Seven day old mice were fed the test article in distilled water vehicle until they were 28 days old. After weaning at 4 weeks, the test compound was mixed directly into their food. Animals were sacrificed after 18 months on test. The postmortem procedure included an external examination and a thorough examination of thoracic and abdominal cavities, with histologic examination of major organs and of all visible lesions. The cranium was not dissected. The entire carcass and all internal organs were fixed and saved. Blood smears were made on all mice before sacrifice, and then examined in cases showing splenomegaly or lymphadenopathy. Statistical analysis included the chi-square test for heterogeneity of proportions after adjustment of stratification (Armitage, 1966), ordinary chi-square tests, regression analyses, the Mantel-Haenszel procedure, and the weighted geometric mean. Seven different chemicals were used as positive controls and were administered via intubation: Ethylcarbamate (158 mg/kg), Ethyleneimine (4.64 mg/kg), Amitrol (1000 mg/kg), Aramite (464 mg/kg), Dihydrosafrole (464 mg/kg), Isosafrole (215 mg/kg) and Safrole (464 mg/kg).

The results of this study were classified "equivocal." Oral administration of the test compound at the maximum tolerated dose resulted in an elevation of tumor incidence in an uncertain range. The positive control chemicals produced the expected incidence and types of tumors in the test animals. The study authors suggest that either additional statistical evaluation and/or experimentation