1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifiers

Product name : Tetraethylthiuram disulfide
Product Number : 86720
Brand : Aldrich
Index-No. : 006-079-00-8
CAS-No. : 97-77-8

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Chemie GmbH
Riedstrasse 2
D-89555 STEINHEIM

Telephone : +49 89-6513-1444
Fax : +49 7329-97-2319
E-mail address : eurtechserv@sial.com

1.4 Emergency telephone number

Emergency Phone # : +49 7329-97-2323

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP]
Acute toxicity, Oral (Category 4)
Specific target organ toxicity - repeated exposure (Category 2)
Skin sensitization (Category 1)
Acute aquatic toxicity (Category 1)
Chronic aquatic toxicity (Category 1)

Classification according to EU Directives 67/548/EEC or 1999/45/EC
Harmful if swallowed. Harmful: danger of serious damage to health by prolonged exposure if swallowed. May cause sensitization by skin contact. Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008 [CLP]

Pictogram

Signal word : Warning
Hazard statement(s)
H373 : May cause damage to organs through prolonged or repeated exposure.
H302 : Harmful if swallowed.
H317 : May cause an allergic skin reaction.
H410 : Very toxic to aquatic life with long lasting effects.
Precautionary statement(s)
P273 Avoid release to the environment.
P280 Wear protective gloves.
P501 Dispose of contents/container to an approved waste disposal plant.

Supplemental Hazard Statements
May produce an allergic reaction.


Hazard symbol(s)

R-phrase(s)
R22 Harmful if swallowed.
R43 May cause sensitization by skin contact.
R48/22 Harmful: danger of serious damage to health by prolonged exposure if swallowed.
R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-phrase(s)
S24 Avoid contact with skin.
S37 Wear suitable gloves.
S60 This material and its container must be disposed of as hazardous waste.
S61 Avoid release to the environment. Refer to special instructions/Safety data sheets.

2.3 Other hazards - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

| Synonyms | Bis(diethylthiocarbamyl) disulfide
|          | Disulfiram
|          | Bis(diethylthiocarbamoyl) disulfide |

Formula : $\text{C}_{10}\text{H}_{20}\text{N}_{2}\text{S}_{4}$

Molecular Weight : 296.54 g/mol

<table>
<thead>
<tr>
<th>Component</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetraethylthiuramdisulfide</td>
<td></td>
</tr>
<tr>
<td>CAS-No.</td>
<td>97-77-8</td>
</tr>
<tr>
<td>EC-No.</td>
<td>202-607-8</td>
</tr>
<tr>
<td>Index-No.</td>
<td>006-079-00-8</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
A serious toxic interaction has been observed in rats fed tetraethylthiuram (antabuse, ro-sulfiram) and then exposed to vapors of 1,2-dibromoethane., May cause nervous system disturbances., Lethargy., Ataxia., Seizures., Coma., thyroid enlargement

4.3 Indication of any immediate medical attention and special treatment needed
no data available

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media
Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides, nitrogen oxides (NOx), Sulphur oxides

5.3 Advice for firefighters
Wear self contained breathing apparatus for fire fighting if necessary.

5.4 Further information
no data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Normal measures for preventive fire protection.

7.2 Conditions for safe storage, including any incompatibilities
Store in cool place. Keep container tightly closed in a dry and well-ventilated place.

7.3 Specific end uses
no data available

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters

8.2 Exposure controls
Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
Personal protective equipment

**Eye/face protection**
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin protection**
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

**Body Protection**
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Respiratory protection**
For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

9. **PHYSICAL AND CHEMICAL PROPERTIES**

9.1 **Information on basic physical and chemical properties**

a) **Appearance**
   Form: powder
   Colour: beige

b) **Odour**
   no data available

c) **Odour Threshold**
   no data available

d) **pH**
   no data available

e) **Melting point/freezing point**
   Melting point/range: 69 - 71 °C

f) **Initial boiling point and boiling range**
   no data available

g) **Flash point**
   no data available

h) **Evaporation rate**
   no data available

i) **Flammability (solid, gas)**
   no data available

j) **Upper/lower flammability or explosive limits**
   no data available

k) **Vapour pressure**
   no data available

l) **Vapour density**
   no data available

m) **Relative density**
   no data available

n) **Water solubility**
   no data available

o) **Partition coefficient: n-octanol/water**
   log Pow: 5

p) **Autoignition temperature**
   no data available

q) **Decomposition temperature**
   no data available

r) **Viscosity**
   no data available
9.2 Other safety information
no data available

10. STABILITY AND REACTIVITY

10.1 Reactivity
no data available

10.2 Chemical stability
no data available

10.3 Possibility of hazardous reactions
no data available

10.4 Conditions to avoid
no data available

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Other decomposition products - no data available

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LDLO Oral - Human - female - 90 mg/kg

LDLO Oral - Human - male - 150 mg/kg
Remarks: Liver:Hepatitis (hepatocellular necrosis), diffuse.

LDLO Oral - Human - 160 mg/kg

LD50 Oral - rabbit - 1.800 mg/kg

LD50 Oral - mouse - 1.980 mg/kg

LD50 Intraperitoneal - rat - 248 mg/kg

LD50 Intraperitoneal - mouse - 75 mg/kg

LD50 Subcutaneous - mouse - 2.600 mg/kg

Skin corrosion/irritation
Serious eye damage/eye irritation
Eyes - rabbit - Mild eye irritation

Respiratory or skin sensitization
May cause allergic skin reaction.

Germ cell mutagenicity
Genotoxicity in vitro - Hamster - ovary
Sister chromatid exchange
Genotoxicity in vitro - Hamster - Embryo
Morphological transformation.
Genotoxicity in vitro - Chicken - Embryo
Other mutation test systems
Genotoxicity in vitro - Human - HeLa cell
DNA inhibition
Genotoxicity in vitro - mouse - Embryo
DNA inhibition
Genotoxicity in vitro - mouse - lymphocyte
Genotoxicity in vitro - Chicken - Embryo
DNA inhibition
Genotoxicity in vivo - mouse - Oral
Sister chromatid exchange
Genotoxicity in vivo - rat - Oral
Morphological transformation.

**Carcinogenicity**
This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

**Reproductive toxicity**
no data available

**Specific target organ toxicity - single exposure**
no data available

**Specific target organ toxicity - repeated exposure**
no data available

**Aspiration hazard**
no data available

**Potential health effects**

<table>
<thead>
<tr>
<th>Exposure Route</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>May be harmful if inhaled. May cause respiratory tract irritation.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Harmful if swallowed.</td>
</tr>
<tr>
<td>Skin</td>
<td>May be harmful if absorbed through skin. May cause skin irritation.</td>
</tr>
<tr>
<td>Eyes</td>
<td>Causes eye irritation.</td>
</tr>
</tbody>
</table>

**Signs and Symptoms of Exposure**
A serious toxic interaction has been observed in rats fed tetraethylthiuram (antabuse, ro-sulfiram) and then exposed to vapors of 1,2-dibromoethane., May cause nervous system disturbances., Lethargy., Ataxia., Seizures., Coma., thyroid enlargement

**Additional Information**
RTECS: JO1225000

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**ECOLOGICAL INFORMATION**

**12.1 Toxicity**

<table>
<thead>
<tr>
<th>Toxicity to fish</th>
<th>LC50 - Poecilia reticulata (guppy) - 0,32 mg/l - 96,0 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toxicity to daphnia and other aquatic invertebrates.</td>
<td>LC50 - Daphnia magna (Water flea) - 0,12 mg/l - 48 h</td>
</tr>
<tr>
<td>Toxicity to algae</td>
<td>Growth inhibition EC50 - Chlorella pyrenoidosa - 1,8 mg/l - 96 h</td>
</tr>
</tbody>
</table>
12.2 Persistence and degradability

12.3 Bioaccumulative potential
   no data available

12.4 Mobility in soil
   no data available

12.5 Results of PBT and vPvB assessment
   no data available

12.6 Other adverse effects
   Very toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods
   **Product**
   Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

   **Contaminated packaging**
   Dispose of as unused product.

14. TRANSPORT INFORMATION

14.1 UN number
   ADR/RID: 3077  IMDG: 3077  IATA: 3077

14.2 UN proper shipping name
   **ADR/RID:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Tetraethylthiuramdisulfide)
   **IMDG:** ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Tetraethylthiuramdisulfide)
   **IATA:** Environmentally hazardous substance, solid, n.o.s. (Tetraethylthiuramdisulfide)

14.3 Transport hazard class(es)
   ADR/RID: 9  IMDG: 9  IATA: 9

14.4 Packaging group
   ADR/RID: III  IMDG: III  IATA: III

14.5 Environmental hazards
   ADR/RID: yes  IMDG Marine pollutant: yes  IATA: yes

14.6 Special precautions for user

   **Further information**
   EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

15. REGULATORY INFORMATION

   This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
   no data available

15.2 Chemical Safety Assessment
   no data available

16. OTHER INFORMATION

   **Further information**
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