Section I. Chemical Product and Company Identification

Chemical Name: Tetramethylthiuram Disulfide
Catalog Number: B0486
Synonym: Thiram, Bis(dimethylthiocarbamoyl)disulfide
Chemical Formula: [(CH₃)₂NCSS]-
CAS Number: 137-26-8

Supplier: TCI America
9211 N. Harborgate St.
Portland OR
1-800-423-8616

In case of Emergency Call
Chemtrec®
(800) 424-9300 (U.S.)
(703) 527-3887 (International)

HAZARD WARNINGS
Toxic compound, do not ingest or inhale. Avoid all contact with this material. Irritating to skin, eyes, and the respiratory system. Carcinogenic material. Mutagenic material. Teratogenic material.

Section II. Composition and Information on Ingredients

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS Number</th>
<th>Percent (%)</th>
<th>TLV/PEL</th>
<th>Toxicology Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetramethylthiuram Disulfide</td>
<td>137-26-8</td>
<td>Min. 97.0 (T)</td>
<td>This chemical is classified as a possible carcinogen. There is no acceptable exposure limit for a carcinogen. This compound is classified as a possible mutagen. There is no acceptable exposure limit for a mutagen.</td>
<td></td>
</tr>
</tbody>
</table>

Rat LD₅₀ (oral) 560mg/kg
Rat LD₅₀ (intraperitoneal) 138mg/kg
Mouse LD₅₀ (intraperitoneal) 1250mg/kg

Section III. Hazards Identification

Acute Health Effects: Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Tumorogenic: rat (oral) 108mg/kg/1 year continuous. Tumorogenic-Equivocal tumorogenic by RTECS criteria. mouse (subcutaneous) 46mg/kg. Tumorogenic-Equivocal tumorogenic by RTECS criteria. mouse (skin) 100mg/kg. Nutritional and gross metabolic-conditional vitamins deficiency. Skin and appendages-tumors. DEVELOPMENTAL TOXICITY-Reproductive: rat (oral) 550mg/kg. Duration: female 1-22 days of pregnancy. Effects on newborn- Behavioral. rat (oral) 420mg/kg. Duration: female 1-20 days of pregnancy. Specific developmental abnormalities- Cardiovascular. Effects on newborn- Biochemical and metabolic. Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section IV. First Aid Measures

Eye Contact: Check for and remove any contact lenses. IMMEDIATELY flush eyes with running water for at least 15 minutes. Keeping eyelids open. COLD water may be used. DO NOT use an eye ointment. Flush eyes with running water for a minimum of 15 minutes, occasionally lifting the upper eyelids. Seek medical attention. Treat symptomatically and supportively.

Skin Contact: After contact with skin, wash immediately with plenty of water. Gently and thorough wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. COLD water may be used. Cover the irritated skin with an emollient. Seek medical attention. Treat symptomatically and supportively. Wash any contaminated clothing before reusing.

Inhalation: Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform artificial respiration. WARNING: It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention and, if possible, show the chemical label. Treat symptomatically and supportively.
Ingestion

INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. Loosen tight clothing such as a collar, tie, belt, or waistband. If the victim is not breathing, administer artificial respiration. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Seek immediate medical attention and, if possible, show the chemical label. Treat symptomatically and supportively.

Section V. Fire and Explosion Data

Flammability

May be combustible at high temperature.

Auto-Ignition

157°C (314.6°F)

Flash Points

Not available.

Flammable Limits

Not available.

Combustion Products

These products are toxic carbon oxides (CO, CO₂), nitrogen oxides (NO, NO₂), sulfur oxides (SO₂, SO₃...).

Fire Hazards

No specific information is available regarding the flammability of this compound in the presence of various materials.

Explosion Hazards

Risks of explosion of the product in presence of mechanical impact: Not available.

Risks of explosion of the product in presence of static discharge: Not available.

No additional information is available regarding the risks of explosion.

Fire Fighting Media and Instructions

SMALL FIRE: Use DRY chemicals, CO₂, water spray or foam.

LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet.

Section VI. Accidental Release Measures

Spill Cleanup Instructions

Toxic material. Irritating material. Possible carcinogenic material. Possible teratogenic material. Possible sensitizing material.

In case of a spill and/or a leak, always shut off any sources of ignition, ventilate the area, and exercise caution. Use a shovel to put the material into a convenient waste disposal container. Consult federal, state, and/or local authorities for assistance on disposal.

Section VII. Handling and Storage

Handling and Storage Information

TOXIC. IRRITANT. POSSIBLE CARCINOGEN. POSSIBLE MUTAGEN. POSSIBLE TERATOGEN. POSSIBLE SENSITIZER. Handle with caution and minimize exposure. Keep away from heat and sources of ignition. Mechanical exhaust required. When not in use, tightly seal the container and store in a dry, cool place. Avoid excessive heat and light. DO NOT ingest. DO NOT breathe dust. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Treat symptomatically and supportively.

Always store away from incompatible compounds such as oxidizing agents, reducing agents, acids.

Section VIII. Exposure Controls/Personal Protection

Engineering Controls

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection

Splash goggles. Lab coat. Dust respirator. Boots. Gloves. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits

This chemical is classified as a possible carcinogen. There is no acceptable exposure limit for a carcinogen. This compound is classified as a possible mutagen. There is no acceptable exposure limit for a mutagen.

Section IX. Physical and Chemical Properties

Physical state @ 20°C

White powder.

Solubility

Insoluble in water, dilute amstic, gasoline. Solubility in alcohol and ether <0.2%. Soluble in chloroform.

Specific Gravity

1.29

Partition Coefficient

Not available.

Molecular Weight

240.44

Vapor Pressure

Not available.

Boiling Point

Not available.

Vapor Density

Not available.

Melting Point

156 to 158°C (312.8 to 316.4°F)

Vaportlity

Not available.

Refractive Index

Not available.

Odor

Characteristic odor.

Critical Temperature

Not available.

Viscosity

Not available.

Taste

Not available.
### Section X. Stability and Reactivity Data

<table>
<thead>
<tr>
<th>Stability</th>
<th>This material is stable if stored under proper conditions. (See Section VII for instructions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conditions of Instability</td>
<td>Avoid excessive heat and light.</td>
</tr>
<tr>
<td>Incompatibilities</td>
<td>Reactive with oxidizing agents, reducing agents, acids.</td>
</tr>
</tbody>
</table>

### Section XI. Toxicological Information

| RTECS Number | JO1400000 |
| Routes of Exposure | Eye contact. Ingestion. Inhalation. Skin contact. |
| Toxicity Data | Rat LD$_{50}$ (oral) 560mg/kg  
|              | Rat LD$_{50}$ (intraperitoneal) 138mg/kg  
|              | Mouse LD$_{50}$ (intraperitoneal) 1250mg/kg |
| Chronic Toxic Effects | **CARCINOGENIC EFFECTS**: Not available.  
|                      | **MUTAGENIC EFFECTS**: Not available.  
|                      | **TERATOGENIC EFFECTS**: Tumorogenic: rat (oral) 108mg/kg/1 year continuous.  
|                      | Tumorogenic- Equivocal tumorogenic by RTECS criteria.  
|                      | mouse (subcutaneous) 46mg/kg.  
|                      | Tumorogenic- Equivocal tumorogenic by RTECS criteria.  
|                      | mouse (skin) 100mg/kg.  
|                      | Nutritional and gross metabolic-conditional vitamins deficiency.  
|                      | Skin and appendages- tumors.  
|                      | **DEVELOPMENTAL TOXICITY**: Reproductive: rat (oral) 550mg/kg. Duration: female 1-22 days of pregnancy.  
|                      | Effects on newborn- Behavioral.  
|                      | rat (oral) 420mg/kg. Duration: female 1-20 days of pregnancy.  
|                      | Specific developmental abnormalities- Cardiovascular.  
|                      | Effects on newborn- Biochemical and metabolic.  
|                      | Repeated exposure to an highly toxic material may produce general deterioration of health by an accumulation in one or many human organs. |
| Acute Toxic Effects | Toxic if ingested or inhaled. Avoid prolonged contact with this material. Overexposure may result in serious illness or death. Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound. |

### Section XII. Ecological Information

| Ecotoxicity | Not available. |
| Environmental Fate | The primary release of thiram to the environment appears to be from its use as a fungicide. Other sources of release may be from production and use as a rubber accelerator, cure retarder, anti-oxidant in plastics and peptizing agent in elastomers. If released to soil, thiram will have low mobility. Volatilization of thiram may not be important from moist or dry soil surfaces. Thiram appears to degrade by a chemical process under acidic conditions to dimethyldithiocarbamate and by microbial degradation. Microbial degradation may be significant in various soils as suggested by faster degradation in unsterilized soil than in sterilized soil. Major metabolites are copper dimethyldithiocarbamate, dithiocarbamate and carbon disulfide. Photolysis of thiram on soil surfaces may be a potential removal mechanism since thiram absorbs sunlight. If released to water, thiram should adsorb onto suspended solids or sediments. Thiram is not expected to volatilize from water surfaces or bioconcentrate in aquatic organisms. Thiram should chemically decompose under acidic conditions, possibly to dimethyldithiocarbamate. Photocatalytic decomposition may be a potential transformation process since thiram absorbs sunlight. Biodegradation is expected to be slow in water based on persistence studies performed in soil. If released to the atmosphere, thiram will exist in both the vapor and particulate phases in the ambient atmosphere. Vapor-phase thiram will react with photolytically generated hydroxyl radicals with an estimated half-life of about 1 hour. Particulate-phase thiram may be physically removed from the air by wet and dry deposition. Probable routes of human exposure are inhalation and dermal exposure of workers to thiram during production, processing, fungicide application or crop harvesting. In addition, human exposure may result due to ingestion or handling of crops intentionally treated with thiram. |

### Section XIII. Disposal Considerations

| Waste Disposal | Recycle to process, if possible. Consult your local or regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state, and local regulations when disposing of the substance. |

### Section XIV. Transport Information

| DOT Classification | Not a DOT controlled material (United States). |
| PIN Number | Not applicable. |
| Proper Shipping Name | Not applicable. |
| Packing Group (PG) | Not applicable. |

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**Emergency phone number**: (800) 424-9300
**Section XV. Other Regulatory Information and Pictograms**

<table>
<thead>
<tr>
<th>TSCA Chemical Inventory (EPA)</th>
<th>This compound is <strong>ON</strong> the EPA Toxic Substances Control Act (TSCA) inventory list.</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHMIS Classification (Canada)</td>
<td>Not available.</td>
</tr>
<tr>
<td>EINECS Number (EEC)</td>
<td>205-286-2</td>
</tr>
<tr>
<td>EEC Risk Statements</td>
<td>R23/24/25- Toxic by inhalation, in contact with skin and if swallowed.</td>
</tr>
<tr>
<td></td>
<td>R36/37/38- Irritating to eyes, respiratory system and skin.</td>
</tr>
<tr>
<td></td>
<td>R45- May cause cancer.</td>
</tr>
<tr>
<td></td>
<td>R46- May cause heritable genetic damage.</td>
</tr>
<tr>
<td>Japanese Regulatory Data</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

**Section XVI. Other Information**

**Notice to Reader**

TCI laboratory chemicals are for research purposes only and are NOT intended for use as drugs, food additives, households, or pesticides. The information herein is believed to be correct, but does not claim to be all inclusive and should be used only as a guide. Neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All chemical reagents must be handled with the recognition that their chemical, physiological, toxicological, and hazardous properties have not been fully investigated or determined. All chemical reagents should be handled only by individuals who are familiar with their potential hazards and who have been fully trained in proper safety, laboratory, and chemical handling procedures. Although certain hazards are described herein, we can not guarantee that these are the only hazards which exist. Our MSDS sheets are based only on data available at the time of shipping and are subject to change without notice as new information is obtained. Avoid long storage periods since the product is subject to degradation with age and may become more dangerous or hazardous. It is the responsibility of the user to request updated MSDS sheets for products that are stored for extended periods. Disposal of unused product must be undertaken by qualified personnel who are knowledgeable in all applicable regulations and follow all pertinent safety precautions including the use of appropriate protective equipment (e.g. protective goggles, protective clothing, breathing equipment, facial mask, fume hood). For proper handling and disposal, always comply with federal, state, and local regulations.

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