1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product code: M2266
Product Name: MORPHOLINOSULFUR TRIFLUORIDE
Chemical Name: Sulfur, trifluoro(morpholinato-kappa.N4)-, (T-4)-
Synonyms: Sulfur, trifluoro(morpholinato-N4)-, (T-4)-
4-Morpholinylsulfur trifluoride
Morpholinotrifluorosulfurane
Trifluoromorpholinosulfur
Recommended use: No information available.
CAS #: 51010-74-3
Formula: C4-H8-F-N-O-S
RTECS #: Not available
CI#: Not available
Supplier: Spectrum Chemicals and Laboratory Products, Inc.
14422 South San Pedro St.
Gardena, CA 90248
(310) 516-8000
Emergency Telephone Number: CHEMTREC: 1-800-424-9300
Contact Person: Martin LaBenz (West Coast)
Contact Person: Chris Terpak (East Coast)

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
DANGER CORROSIVE! The product causes burns of eyes, skin and mucous membranes. WARNING! COMBUSTIBLE LIQUID. Water Reactive.

Odor: Sulfurous
Physical state: Liquid.
Appearance: No information available
Color: Colorless. Light yellow.

OSHA Regulatory Status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)
2. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS

Principal Routes of Exposure:
Skin. Inhalation. Ingestion.

Acute Potential Health Effects:

Skin Contact:
Causes skin burns.

Eye Contact:
Causes eye burns.

Inhalation:
Causes chemical burns to the respiratory tract.

Ingestion:
Causes burns. Can burn mouth, throat, and stomach.

Chronic Potential Health Effects:

Target Organs: No information available
Carcinogen Status: No information available
Mutagenic Effects: No information available
Teratogenic Effects: No information available
Aggravated Medical Conditions: No information available

See Section 11 for additional Toxicological Information

POTENTIAL ENVIRONMENTAL EFFECTS

No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morpholinosulfur Trifluoride</td>
<td>51010-74-3</td>
<td>100</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

General Advice:
Poison information centres in each State capital city can provide additional assistance for scheduled poisons (13 1126). Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Skin Contact:
Wash off immediately with soap and plenty of water. Continue flushing with plenty of water for at least 15 minutes. Remove all contaminated clothes and shoes. Immediate medical attention is required. Call a physician immediately.

Eye Contact:
Flush eye with water for 15 minutes. Immediate medical attention is required. Call a physician immediately.

Product code: M2266  Product name: MORPHOLINOSULFUR TRIFLUORIDE
Inhalation: Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. WARNING! It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled or ingested material is toxic, infectious or corrosive. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Immediate medical attention is required. Call a physician immediately.

Ingestion: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Immediate medical attention is required. Call a physician or Poison Control Centre immediately.

Notes to Physician: Treat symptomatically

5. FIRE-FIGHTING MEASURES

Flammable Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flashpoint (°C/°F)</td>
<td>76 °C/168.80 °F</td>
</tr>
<tr>
<td>Tested according to:</td>
<td>Closed cup</td>
</tr>
<tr>
<td>Lower Explosion Limit (%)</td>
<td>No information available</td>
</tr>
<tr>
<td>Upper Explosion Limit (%)</td>
<td>No information available</td>
</tr>
<tr>
<td>Autoignition Temperature (°C/°F)</td>
<td>No information available</td>
</tr>
</tbody>
</table>

Suitable Extinguishing Media: Carbon dioxide (CO2). Dry chemical.

Unsuitable Extinguishing Media: Water.

Hazardous Combustion Products: Carbon oxides, Nitrogen oxides, Sulfur oxides, Hydrogen fluoride gas, Hydrogen gas by reaction with water or metals

Specific hazards: Combustible material. May be ignited by heat, sparks or flames. Container explosion may occur under fire conditions or when heated. Containers may explode if contaminated with water. Contact with metals may evolve flammable hydrogen gas. Substance will react with water, releasing corrosive and/or toxic gases and runoff. Evolves flammable hydrogen gas on contact with water. Flammable/toxic gases may accumulate in confined areas (basement, tanks, hopper/tank cars, etc.).

Special Protective Equipment for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear

Specific Methods: For fires involving tanks or car/trailer load, cool containers with flooding quantities of water until well after the fire is out. For large fires, flood the area with large quantities of water. Use water spray to knock down vapors. Do not put water directly on fire or containers involved in fire.. Do not get water inside containers.
6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:
Keep people away from and upwind of spill/leak. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Use personal protective equipment. Remove all sources of ignition. All equipment used when handling the product must be grounded. Use spark-proof tools and explosion-proof equipment. Do not expose spill to water. Do not get water inside containers. Use water spray to reduce vapors; do not put water directly on leak, spill area or inside container.

Environmental Precautions:
Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewers, basements or confined areas. Should not be released into the environment. Do not let product enter drains.

Methods for Cleaning Up:
Absorb spill with inert material (e.g. vermiculite, dry sand or earth), then place in a suitable chemical waste container. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Handling

Technical Measures/Precautions:
Use only in area provided with appropriate exhaust ventilation. Remove all sources of ignition. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Keep away from incompatible materials.

Safe Handling Advice:
Wear personal protective equipment. Avoid contact with skin, eyes and clothing. Avoid dust formation. Keep away from heat and sources of ignition. Do not ingest. Do not breathe vapours/dust. Handle in accordance with good industrial hygiene and safety practice.

Storage

Technical Measures/Storage Conditions:
Moisture sensitive. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep refrigerated. Keep at temperatures between 2 and 8 °C. Store in a segregated and approved area. Store away from incompatible materials.

Incompatible Products:

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures to reduce exposure:
Ensure adequate ventilation. Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors and mist below their respective threshold limit value.

Personal Protective Equipment

Eye protection: Face-shield.

Skin and body protection: Chemical resistant protective suit. Gloves. boots.

Respiratory protection: Vapor respirator. Be sure to use an approved/certified respirator or equivalent.

Product code: M2266  Product name: MORPHOLINOSULFUR TRIFLUORIDE
Hygiene measures: Avoid contact with skin, eyes and clothing. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product.

National occupational exposure limits

United States
U.S Occupational Exposure Limits: Not determined

Canada
Canada Occupational Exposure Limits: Not determined

Australia and Mexico
Occupational Exposure Limits for Australia and Mexico: Not determined

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor: Sulfurous.</td>
<td>Taste: No information available</td>
<td>Molecular weight: 175.17</td>
</tr>
<tr>
<td>Flash point (°C): 76</td>
<td>Lower Explosion Limit (%): No information available</td>
<td>Upper Explosion Limit (%): No information available</td>
</tr>
<tr>
<td>Autoignition Temperature (°C/°F): No information available</td>
<td>pH: No information available</td>
<td>Boiling point/range(°C/°F): 41-42 °C/106-108 °F @ 0.5 mm Hg</td>
</tr>
<tr>
<td>Melting point/range(°C/°F): No information available</td>
<td>Decomposition temperature(°C/°F): No information available</td>
<td>Specific gravity: No information available</td>
</tr>
<tr>
<td>Density (g/cm3): 1.436</td>
<td>Bulk density: No information available</td>
<td>Vapor pressure @ 20°C (kPa): No information available</td>
</tr>
<tr>
<td>Vapor density: 6.04</td>
<td>Evaporation rate: No information available</td>
<td>VOC content (g/L): No information available</td>
</tr>
<tr>
<td>Odor threshold (ppm): No information available</td>
<td>Partition coefficient (n-octanol/water): No information available</td>
<td>Miscibility: No information available</td>
</tr>
<tr>
<td>Solubility: No information available</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

Stability: Stable at normal conditions


Possibility of Hazardous Reactions: Reacts with water. Evolves flammable hydrogen gas on contact with water.

Polymerization: Hazardous polymerisation does not occur

Product code: M2266 Product name: MORPHOLINOSULFUR TRIFLUORIDE
Corrosivity: No information available

Special Remarks on Corrosivity: No information available

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Component Information

Morpholinosulfur Trifluoride - 51010-74-3

LD50/oral/rat = No information available
LD50/oral/mouse = No information available
LD50/dermal/rabbit = Not determined
LD50/dermal/rat = No information available
LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available

Product Information

LC50/inhalation/rat = No information available
LC50/inhalation/mouse = No information available
LD50/dermal/rabbit = No information available
LD50/dermal/rat = Not determined
LD50/oral/rat = No information available
LD50/oral/mouse = No information available

Local Effects

Skin irritation: Causes burns.
Eye irritation: Causes burns.
Inhalation: Causes chemical burns to the respiratory tract. Symptoms may include burning sensation in the nose and throat, coughing, wheezing, shortness of breath and possibly pulmonary edema.
Ingestion: Causes digestive or gastrointestinal tract burns. May cause perforation of the digestive tract.
Sensitization: No information available

Chronic Toxicity

Chronic Toxicity: No information available
Carcinogenic effects: Not considered carcinogenic
Mutagenic Effects: No information available
Reproductive Effects: No information available
Teratogenic Effects: No information available
Target Organs: No information available

Product code: M2266
Product name: MORPHOLINOSULFUR TRIFLUORIDE
12. ECOLOGICAL INFORMATION

**ECOTOXICITY**

Toxicity to terrestrial and aquatic plants and animals: No information available

Ecotoxicity effects: No data available

Aquatic toxicity: No information available

Mobility: No information available

Persistence and degradability: No information available

Bioaccumulative potential: No information available

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products:
Waste must be disposed of in accordance with Federal, State and Local regulation.

Contaminated packaging:
Empty containers should be taken for local recycling, recovery or waste disposal

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Morpholinosulfur Trifluoride</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION

**DOT**

UN-No: UN1760

Proper Shipping Name: Corrosive liquid, n.o.s. (morpholinosulfur trifluoride)

Hazard Class: 8

Packing Group: III

Subsidiary Risk: Not applicable

Marine Pollutant: No data available

ERG No: 137

DOT RQ (lbs): No information available

Symbol(s): G

**TDG (Canada)**

Proper Shipping Name: Corrosive liquid, n.o.s. (morpholinosulfur trifluoride)

UN-No: UN1760

Hazard Class: 8

Packing Group: III

Subsidiary Risk: No information available

Description: No information available

**ADR**

Proper Shipping Name: Corrosive liquid, n.o.s. (morpholinosulfur trifluoride)

UN-No: UN1760

Hazard Class: 8

Packing Group: III

Subsidiary Risk: No information available

Classification Code: No information available

Description: No information available

CEFIC Tremcard No: No information available

Product code: M2266  
Product name: MORPHOLINOSULFUR TRIFLUORIDE
IMO / IMDG
Proper Shipping Name: Corrosive liquid, n.o.s. (morpholinosulfur trifluoride)
UN-No: UN1760
Hazard Class: 8
Subsidiary Risk: No information available
Packing Group: III
Description: No information available
IMDG Page: No information available
Marine Pollutant: No information available
EMS: F-A
MFAG: No information available
Maximum Quantity: No information available

RID
Proper Shipping Name: Corrosive liquid, n.o.s. (morpholinosulfur trifluoride)
UN-No: UN1760
Hazard Class: 8
Packing Group: III
Subsidiary Risk: 8
Classification Code: No information available
Description: No information available

ICAO
UN-No: UN1760
Hazard Class: 8
Proper Shipping Name: Corrosive liquid, n.o.s. (morpholinosulfur trifluoride)
Packing Group: III
Subsidiary Risk: No information available
Description: No information available

IATA
Proper Shipping Name: Corrosive liquid, n.o.s. (morpholinosulfur trifluoride)
UN-No: UN1760
Hazard Class: 8
Packing Group: III
Subsidiary Risk: No information available
ERG Code: 8L
Description: No information available

15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Components</th>
<th>U.S. TSCA</th>
<th>Philippines (PICCS)</th>
<th>KOREA KECL</th>
<th>Japan ENCS</th>
<th>CHINA</th>
<th>Australia (AICS)</th>
<th>EINECS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morpholinosulfur Trifluoride</td>
<td>Not Listed</td>
<td>Not present</td>
<td>Not present</td>
<td>Not present</td>
<td>Not present</td>
<td>Not present</td>
<td>Not present</td>
</tr>
</tbody>
</table>

U.S. Regulations


Chemicals Known to the State of California to Cause Cancer:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)

Chemicals Known to the State of California to Cause Reproductive Toxicity:
This product does not contain a chemical requiring a warning under California Prop. 65. (See table below)
<table>
<thead>
<tr>
<th>Components</th>
<th>Carcinogen</th>
<th>Developmental Toxicity</th>
<th>Male Reproductive Toxicity</th>
<th>Female Reproductive Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morpholinosulfur Trifluoride</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

**CERCLA/SARA**

<table>
<thead>
<tr>
<th>Components</th>
<th>CERCLA - Hazardous Substances and their Reportable Quantities</th>
<th>Section 302 Extremely Hazardous Substances and TPQs</th>
<th>Section 302 Extremely Hazardous Substances and RQs</th>
<th>Section 313 - Chemical Category</th>
<th>Section 313 - Reporting de minimis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morpholinosulfur Trifluoride</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

**U.S. TSCA**

<table>
<thead>
<tr>
<th>Components</th>
<th>TSCA Section 5(a)2 - Chemicals With Significant New Use Rules (SNURS)</th>
<th>TSCA 8(d) - Health and Safety Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morpholinosulfur Trifluoride</td>
<td>Not Applicable</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

**Canada**

**WHMIS hazard class:**
- E  Corrosive material
- B3  Combustible liquid
- B6  Reactive flammable material

**Canada Controlled Products Regulation:**
This product has been classified according to the hazard criteria of the CPR (Controlled Products Regulation) and the MSDS contains all of the information required by the CPR.

**Inventory**

<table>
<thead>
<tr>
<th>Components</th>
<th>Canada (DSL)</th>
<th>Canada (NDSL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morpholinosulfur Trifluoride</td>
<td>Not Listed</td>
<td>Not Listed</td>
</tr>
</tbody>
</table>

**EU Classification**

**R -phrase(s)**
- R14 - Reacts violently with water.
- R34 - Causes burns.

**S -phrase(s)**
- S 8 - Keep container dry.
- 28A - After contact with skin, wash immediately with plenty of water.
- S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
- S36/37/39 - Wear suitable protective clothing, gloves and eye/face protection.

**The product is classified in accordance with Annex VI to Directive 67/548/EEC**

**Indication of danger:**
- C - Corrosive.

**Product code:** M2266  **Product name:** MORPHOLINOSULFUR TRIFLUORIDE
16. OTHER INFORMATION

The MSDS format complies with ANSI Z400.1-2004 standards.

Preparation Date: 07-Sep-2010

Reason for revision: Not applicable

Prepared by: Sonia Owen

Literature reference: No information available

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. The physical properties reported in this MSDS are obtained from the literature and do not constitute product specifications. Information contained herein does not constitute a warranty, whether expressed or implied, as to the safety, merchantability or fitness of the goods for a particular purpose. Spectrum Chemicals & Laboratory Products, Inc. assumes no responsibility for results obtained or for incidental or consequential damages, including lost profits, arising from the use of these data. No warranty against infringement of any patent, copyright or trademark is made or implied. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum assumes no responsibility for the completeness or accuracy of the information contained herein.