Material Safety Data Sheet for:
Trimethylsilane [(CH₃)₃SiH]

In an emergency, call CHEMTREC at 800-424-9300 or 703-527-3887.

Section 1: Chemical Product and Company Identification

Material Name: Trimethylsilane
Chemical Formula: (CH₃)₃SiH

Synonyms: Trisilylmethane; 2-Methyl-2-silapropane; Trimethylsilyl hydride; Silane, trimethyl-

Manufacturer: Voltaix, LLC
Post Office Box 5357, North Branch, New Jersey 08876-5357, USA
Voice: 908-231-9060 or 800-VOLTAIX, Facsimile: 908-231-9063

This MSDS is Copyrighted, Voltaix, 2012. Permission is hereby granted to duplicate it, in its entirety, for distribution with this material.

Section 2: Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS Registry Number</th>
<th>Concentration</th>
<th>Exposure Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trimethylsilane</td>
<td>993-07-7</td>
<td>100%</td>
<td>5 ppm TWA (See Section 11)</td>
</tr>
</tbody>
</table>

Section 3: Hazards Identification

EMERGENCY OVERVIEW
DANGER! FLAMMABLE.

Trimethylsilane is a colorless gas with a slight odor. The immediate health hazard is that it may cause thermal burns. It is flammable, and may form mixtures with air that are flammable or explosive. Trimethylsilane is reactive with oxidizers and halogens; it may be reactive with water. Contents of cylinder may be combination of gas and liquefied gas.

NFPA 704 Rating:
- Health: 2
- Fire: 4
- Reactivity: 1
- Special: None

Potential Health Effects

Routes of Exposure:
The primary route of exposure is inhalation.

Lengths of Exposure:
No data available.

Severity of Effect:
Unknown, presumed to depend on concentration and duration.

Target Organs:
None identified.

Type of Effect:
No effect identified.

Signs and Symptoms of Exposure:
Suspected to cause headache, dizziness, nausea, vomiting and weakness. May irritate eyes and skin.

Medical Conditions that may be Aggravated by Exposure:
None identified.

Reported Carcinogenic and Reproductive Effects:
None known.

Section 4: First Aid Measures

MSDS Number: Si080
Revised: 21 March 2012
Inhalation
Inhalation is the primary route of exposure.

1) Remove the affected person from the gas source or contaminated area. Note: Personal Protective Equipment (PPE), including positive pressure, self contained breathing apparatus, may be required to assure the safety of the rescuer.

2) If the affected person is not breathing spontaneously, administer rescue breathing.

3) If the affected person does not have a pulse, administer CPR.

4) If medical oxygen and appropriately trained personnel are available, administer 100% oxygen to the affected person.

5) Summon an emergency ambulance. If an ambulance is not available, contact a physician, hospital, or poison control center for instruction.

6) Keep the affected person warm, comfortable, and at rest while awaiting professional medical care. Monitor the breathing and pulse continuously. Administer rescue breathing or CPR if necessary.

Skin Contact
Flush with a copious stream of water while removing contaminated clothing. Continue flushing until the professional medical assistance arrives, but for no less than fifteen minutes. Treat thermal burns by assuring that affected area is cool by flushing with cool water, then apply dry sterile dressings. If the patient is burned on the face, neck, head, or chest, assume that the airway may also have been burned and obtain professional medical assistance immediately.

If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115°F; 41-46°C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.

Eye Contact
Flush continuously with clean water until the professional medical assistance arrives, but for no less than thirty minutes. Continuation of flushing until patient is transferred to an ophthalmologist or emergency physician is recommended.

Ingestion
Ingestion is not an observed route of exposure to gaseous materials.

Chronic Effects
None is known to Voltaix.

Note to Physicians:
The reaction product of trimethylsilane and air is silicon oxide (silica). Therefore, skin and eye burns should be irrigated to the extent the physician feels necessary to remove the silicon oxide to an acceptable degree. Thereafter, treatment for burns is as usual.

Section 5: Fire Fighting Measures

Flammability and Explosivity

Flammability and Explosivity

Flash Point:
-69.2°C (-92.5°F)

Flammability Limits in Air (% by volume):

<table>
<thead>
<tr>
<th></th>
<th>Upper</th>
<th>Lower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trimethylsilane</td>
<td>51.3%</td>
<td>1.38%</td>
</tr>
</tbody>
</table>
Autoignition Temperature:
235°C (455°F)

Flammability Classification (per 29 CFR 1910.1200):
Flammable gas.

Known or Anticipated Hazardous Products of Combustion:
Silicon oxide (silica), carbon monoxide may be given off during combustion.

Properties that may Initiate or Intensify Fire:
Heating cylinder to the point of activating the pressure relief device.

Reactions that Release Flammable Gases:
Decomposition releases hydrogen; reaction with water may release methane.

Extinguishing Media
Dry chemical, water spray or carbon dioxide. Use water spray to knock down vapors and cool surrounding containers.

Fire Fighting Instructions
The only safe way to extinguish a flammable gas fire is to stop the flow of gas. If the flow cannot be stopped, allow the entire contents of the cylinder to burn. Cool the cylinder and surroundings with water from a suitable distance. Extinguishing the fire without stopping the flow of gas may permit the formation of ignitable or explosive mixtures with air. These mixtures may propagate to a source of ignition.

Excessive pressure may develop in gas cylinders exposed to fire, which may result in explosion, regardless of the cylinder’s content. Cylinders with pressure relief devices (PRD’s) may release their contents through such devices if the cylinder is exposed to fire. Cylinders without PRD’s have no provision for controlled release and are therefore more likely to explode if exposed to fire.

Positive pressure, self contained breathing apparatus is required for all fire fighting involving hazardous materials. Full structural fire fighting (bunker) gear is the minimum acceptable attire. The need for proximity, entry, and flashover protection and special protective clothing should be determined for each incident by a competent fire fighting safety professional.

Section 6: Accidental Release Measures

Containment
This material is a gas at atmospheric conditions. The only means of containment is the enclosure of the space into which the material is released. Such containment is described in Section 7.

Clean Up
Clean up consists of passing the entire gas volume of the enclosure through appropriate exhaust gas treatment equipment (EGTE). Purge the enclosure with a non-reactive gas, such as nitrogen, through the EGTE until an acceptably low level of contamination remains. Equipment contaminated by this material must then be cleaned or decommissioned appropriately.

Evacuation
If the release is not contained in an appropriate device or system, all personnel not appropriately protected (see Section 8) must evacuate the contaminated spaces. Consider evacuation of additional areas, as a precaution against the spread of the release or subsequent explosion or fire.

Special Instructions
Some releases of trimethylsilane mixtures into air will produce silicon oxide, a white powder that may be suspended in the air if produced in this manner.

Section 7: Handling and Storage

Handling
Handle this material only in sealed, purged systems. The design of handling systems for hazardous materials is beyond the scope of this MSDS, and should be performed by a competent, experienced professional. Consider the use of doubly-contained piping; diaphragm or bellows sealed, soft seat valves; backflow prevention devices; flash arrestors; and flow monitoring or limiting devices. Gas cabinets, with appropriate exhaust treatment, are recommended, as is automatic monitoring of the secondary enclosures and work areas for release.

Handle sealed gas cylinders in accordance with CGA P-1, *Safe Handling of Compressed Gases in Containers*.

Some material may have accumulated behind the outlet plug. Face the outlet away from you and wear appropriate protective equipment when removing the plug to connect the cylinder to your system.

Never introduce any substance into a gas cylinder. If you believe your cylinder may have been contaminated, notify Voltaix immediately. Provide as much information as possible on the nature and quantity of contamination.

**Storage**

Store cylinders in accordance with CGA P-1, *Safe Handling of Compressed Gases in Containers*, local building and fire codes and other relevant regulations. Materials should be segregated, by the hazards they comprise, for storage.

Protect the cylinders from direct sunlight, precipitation, mechanical damage, and temperatures above 55°C (130 °F).

Ship and store cylinders with the outlet plug and valve protective cap in place.

### Section 8: Exposure Control/Personal Protection

#### Engineering Controls

Local exhaust is required. Secondary containment, with appropriate exhaust gas treatment, is strongly encouraged and is required in some jurisdictions.

Monitor the work area and the secondary containment continuously for release of the material. Automatic alerting of personnel and automatic shutdown of flow are appropriate in most applications and are required in some jurisdictions.

Purge all primary containment systems with a nonreactive gas, such as nitrogen, before introducing trimethylsilane.

#### Personal Protective Equipment (PPE)

**Respiratory Protection:**

Positive pressure, full face, air supplied breathing apparatus should be used for work within the secondary containment equipment if a leak is suspected or the primary containment is to be opened, e.g., for a cylinder change. Air supplied breathing apparatus is required for response to demonstrated or suspected releases from the primary containment.

**Eye/Face Protection:**

When using respiratory protection as described above, use a face mask that provides splash and impact protection for the face and eyes. For handling sealed cylinders, wear safety glasses.

**Skin Protection:**

Wear appropriate gloves when handling sealed cylinders. Use gloves and other skin protection, as assigned by a competent safety professional, when working within the secondary enclosure with the primary enclosure compromised, e.g., cylinder changing, to protect from exposure to the material and from fire that may result from its release to the air.

**Other Protection:**

Wear appropriate protective footwear when moving cylinders. Select per OSHA 29CFR1901.132 and 1910.133.

### Exposure Guidelines
Section 9: Physical and Chemical Properties

Notes:  1) "N/A" means not applicable.
      2) Unless otherwise specified, properties are reported at 0 °C (32 °F) and 1 atmosphere (1.0 bar, 14.7 psia).

<table>
<thead>
<tr>
<th>Property</th>
<th>Trimethylsilane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Slight, repulsive</td>
</tr>
<tr>
<td>Physical state</td>
<td>Liquefied Gas</td>
</tr>
<tr>
<td>pH</td>
<td>N/A</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>594 mmHg at 0 °C</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>~2.6 (Air = 1)</td>
</tr>
<tr>
<td>Boiling point (at 1 atm)</td>
<td>6.7 °C (44 °F)</td>
</tr>
<tr>
<td>Melting point</td>
<td>-135.9 °C</td>
</tr>
<tr>
<td>Solubility in water (v/v)</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Specific gravity of liquid</td>
<td>0.638 at 6.7 °C</td>
</tr>
<tr>
<td>(water = 1)</td>
<td></td>
</tr>
<tr>
<td>Molecular weight</td>
<td>74.2</td>
</tr>
</tbody>
</table>

Section 10: Stability and Reactivity

Chemical Stability:
Stable at room temperature and atmospheric pressure. Decomposes to silicon carbide and hydrogen at elevated temperatures (above 500 °C).

Conditions to Avoid:
Sources of ignition, exposure to air.

Incompatibility with Other Materials:
Air, oxidizers, halogens, acids, alkalis

Hazardous Decomposition, Reaction and Oxidation (other than burning) Products:
Silicon oxide, hydrogen, methane.

Hazardous Polymerization:
Has not been observed.

Section 11: Toxicological Information

Acute Data (by route):
No information is known on the acute toxicity of trimethylsilane. By analogy with silane, exposure by inhalation may cause headache or nausea. Reaction with air or water may produce irritation or thermal burns to skin, eyes and mucous membranes. LC50, 4-hour, rat for silane is 9600 ppm. The 8 hour TWA for silane (5 ppm) is based on silane being one-tenth as toxic as germanium tetrahydride. The 1-hour LC50 for trimethylsilane is >5,000 ppm (ISO, CGA P-20).

Chronic and Subchronic Data:
Trimethylsilane is not listed in the Registry of Toxic Effects of Chemical Substances (RTECS); no information on its carcinogenicity is known.
Special Studies:
None known. No published exposure guidelines for trimethylsilane are known to Voltaix. Because trimethylsilane is similar in structure and properties to silane (SiH₄), Voltaix recommends a Time Weighted Average of 5 ppm, which is the TWA specified by ACGIH, OSHA and NIOSH for silane.

Section 12: Ecological Information

Ecotoxicity:
None known.

Environmental Fate:
None known.

Section 13: Disposal Considerations

Classification under RCRA, 40 CFR 261:
Not Listed.

US EPA waste number and descriptions:
D001 (ignitability)

Special Instructions and Limitations:
Treat process and other exhaust streams appropriately before release to the atmosphere.

Notice:
The information above is derived from Voltaix’s interpretation of the US federal laws, regulations and policies concerning the material, as shipped by Voltaix, at the time this MSDS was prepared. Federal controls are subject to change and state and local controls may also apply. Proper waste disposal is the responsibility of the owner of the waste. The user is encouraged to consult with appropriate experts in developing a disposal plan.

Section 14: Transport Information

Basic Description:
Compressed Gas, Flammable, n.o.s. (Trimethylsilane), Division 2.1 (Flammable Gas), UN 1954
If Liquefied Gas Present: Liquefied Gas, Flammable, n.o.s. (Trimethylsilane), Division 2.1 (Flammable Gas), UN 3161

Additional Information for shipment by water:
IMDG Page Number 2124 for UN 1954 and 2155-1 for UN 3161.

Additional Information for shipment by air:
Cargo air transportation only is permitted.

Section 15: Regulatory Information

TSCA Status:
Listed in the index of chemical substances.

CERCLA Reportable Quantity (40CFR302.4):
This material is not listed. The Reportable Quantity (RQ) for “Unlisted Hazardous Wastes Characteristic of Ignitability” (D001) of 45.4 kg (100 lbs.) therefore applies.

SARA Title III Status (Section 302 (40CFR355), Section 311/312, Section 313 (40CFR372)):
No Threshold Planning Quantities (TPQ’s) or Reportable Quantities (RQ’s) are listed for these substances. The default federal MSDS submission and inventory requirement filing threshold of 4,540 kg (10,000 lbs.) therefore applies.

Note: State and local requirements may be more stringent.
## Section 16: Other Information

### References

- **Documentation of TLV’s and BEI’s.** Cincinnati, Ohio: American Conference of Government Industrial Hygienists, 1992.

### Revision Indication

- Revised 12 March 2007: updated company name.
- Revised 21 March 2012: updated format and contents.

### Disclaimer

Voltaix cannot guarantee that these are the only hazards that exist. Users are solely responsible for the safe storage, handling, use and disposal of this material, and for compliance with the applicable laws, regulations and accepted practices.

Voltaix makes no representations or warranties, either expressed or implied, of merchantability, fitness for a particular purpose, or any other nature.