

SECTION 1: Product and company identification

1.1. Product identifier

Product form : Substance
Name : Trimethylsilane
CAS No : 993-07-7
Formula : C₃H₁₀Si
Other means of identification : trimethylsilylhydride

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

Use of the substance/mixture : Industrial use. Use as directed.

1.3. Details of the supplier of the safety data sheet

Praxair, Inc.
10 Riverview Drive
Danbury, CT 06810-6268 - USA
T 1-800-772-9247 (1-800-PRAXAIR) - F 1-716-879-2146
www.praxair.com

1.4. Emergency telephone number

Emergency number : Onsite Emergency: 1-800-645-4633

CHEMTREC, 24hr/day 7days/week
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887
(collect calls accepted, Contract 17729)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-US classification

Flam. Gas 1 H220
Liquefied gas H280
Skin Irrit. 2 H315
Eye Irrit. 2A H319

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :



Signal word (GHS-US) :

DANGER

Hazard statements (GHS-US) :

H220 - **EXTREMELY FLAMMABLE GAS**
H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
H315 - CAUSES SKIN IRRITATION
H319 - CAUSES SERIOUS EYE IRRITATION

Precautionary statements (GHS-US) :

P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from Heat/Open flames/Sparks/Hot surfaces. - No smoking
P223 - Do not allow contact with water
P231+P232 - Handle under inert gas. Protect from moisture
P233 - Keep container tightly closed
P235 - Keep cool
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge
P261 - Avoid breathing gas, vapors

Trimethylsilane

Safety Data Sheet P-6301

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.
Date of issue: 06/01/2004 Revision date: 10/27/2016 Supersedes: 03/18/2016

- P264 - Wash exposed skin thoroughly after handling
- P271 - Use and store only outdoors or in a well-ventilated area
- P280+P284 - Wear protective gloves, protective clothing, eye protection, respiratory protection, and/or face protection
- P370+P378 - In case of fire: Use dry sand, dry extinguishing powder, alcohol resistant foam to extinguish
- P402 - Store in a dry place
- P404 - Store in a closed container
- P405 - Store locked up
- P302+P352 - If on skin: Wash with plenty of water
- P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing.
- P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- P312 - Call a poison center/doctor if you feel unwell
- P321 - Specific treatment (see First aid measures on this label)
- P332+P313 - If skin irritation occurs: Get medical advice/attention
- P362 - Take off contaminated clothing and wash before reuse
- P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely
- P381 - Eliminate all ignition sources if safe to do so
- P410+P403 - Protect from sunlight. Store in a well-ventilated place
- P501 - Dispose of contents/container in accordance with container Supplier/owner instructions

2.3. Other hazards

Other hazards not contributing to the classification : None.

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/Information on ingredients

3.1. Substance

Name	Product identifier	%
Trimethylsilane (Main constituent)	(CAS No) 993-07-7	100

3.2. Mixture

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures after inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician.
- First-aid measures after skin contact : Wash with plenty of soap and water. If irritation persists, consult a doctor. The liquid may cause frostbite. For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). Water temperature should be tolerable to normal skin. Maintain skin warming for at least 15 minutes or until normal coloring and sensation have returned to the affected area. In case of massive exposure, remove clothing while showering with warm water. Seek medical evaluation and treatment as soon as possible.
- First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.
- First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries after inhalation : MAY CAUSE RESPIRATORY IRRITATION.
- Symptoms/injuries after skin contact : MAY CAUSE SKIN IRRITATION.
- Symptoms/injuries after eye contact : MAY CAUSE EYE IRRITATION.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Foam, dry chemical, carbon dioxide.
Unsuitable extinguishing media : **Do not use halon fire extinguisher.** May react with water to form methane, which is flammable.

5.2. Special hazards arising from the substance or mixture

- Fire hazard : This product is flammable.
Explosion hazard : MAY FORM EXPLOSIVE MIXTURES WITH AIR.
Reactivity : May react with water to form methane, which is flammable. This product reacts with air to produce silica dust.

5.3. Advice for firefighters

- Firefighting instructions : **DANGER: Flammable, liquefied gas.** FORMS EXPLOSIVE MIXTURES WITH AIR. Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Remove all sources of ignition if safe to do so. Reduce vapors with fog or fine water spray, taking care not to spread liquid with water. Shut off flow if safe to do so. Ventilate area or move container to a well-ventilated area. Flammable vapors may spread from leak and could explode if reignited by sparks or flames. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with an appropriate device.
- Protection during firefighting : Avoid direct of product with water. May react with water to form methane, which is flammable.
- Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
- Other information : Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.).

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : **DANGER! Flammable, liquefied gas.** MAY FORM EXPLOSIVE MIXTURES WITH AIR. Avoid contact of substance with water. May react with water to form methane, which is flammable. Immediately evacuate all personnel from danger area. Do not approach area without self-contained breathing apparatus and protective clothing. If cylinders are leaking, reduce toxic vapors with water spray or fog. Reverse flow into cylinder may cause rupture. (See section 16.) Shut off flow if without risk. Ventilate area or move cylinder to a well-ventilated area.

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Try to stop release. Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

6.3. Methods and material for containment and cleaning up

No additional information available

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment

Use only in a closed system thoroughly purged with an inert gas prior to introduction of trimethylsilane from cylinder. Close cylinder valve after each use; keep closed even when empty. **Material may accumulate behind valve outlet cap or plug.** Wear appropriate protective equipment, and face the outlet away from you before removing the cap or plug

Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g. wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store only where temperature will not exceed 125°F (52°C). Post “No Smoking/No Open Flames” signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g. NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Trimethylsilane (993-07-7)		
ACGIH	ACGIH TLV-TWA (ppm)	5 ppm Praxair recommends use of the 5ppm TLV for silane (CAS 7803-62-5)
ACGIH	Remark (ACGIH)	Praxair recommends use of the 5 ppm TLV for silane (silicon tetrahydride), CAS 7803-62-5
USA OSHA	Not established	

Trimethylsilane

Safety Data Sheet P-6301

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8.2. Exposure controls

- Appropriate engineering controls : Use an explosion-proof local exhaust system. Local exhaust and general ventilation must be adequate to meet exposure standards. MECHANICAL (GENERAL): **Inadequate - Use only in a closed system.** Use explosion proof equipment and lighting.
- In semiconductor process gas and other suitable applications, Praxair recommends the use of engineering controls such as gas cabinet enclosures, automatic gas panels (used to purge systems on cylinder changeout), excess-flow valves throughout the gas distribution system, double containment for the distribution system, and continuous gas monitors.
- Eye protection : Wear safety glasses when handling cylinders; vapor-proof goggles and a face shield during cylinder changeout or whenever contact with product is possible. Select eye protection in accordance with OSHA 29 CFR 1910.133.
- Skin and body protection : Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear appropriate chemical gloves during cylinder changeout or wherever contact with product is possible. Select per OSHA 29 CFR 1910.132, 1910.136, and 1910.138.
- Respiratory protection : When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).
- Thermal hazard protection : Wear cold insulating gloves when transfilling or breaking transfer connections.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- Physical state : Gas
- Molecular mass : 74.2 g/mol
- Color : Colorless.
- Odor : Slight Repulsive
- Odor threshold : No data available
- pH : Not applicable.
- Relative evaporation rate (butyl acetate=1) : No data available
- Relative evaporation rate (ether=1) : Not applicable.
- Melting point : -136 °C (-212.6°F)
- Freezing point : No data available
- Boiling point : 6.7 °C (44°F)
- Flash point : -20 °C (-4°F)
- Auto-ignition temperature : 235 °C (455°F)
- Decomposition temperature : No data available
- Flammability (solid, gas) : 2 - 44 vol %
- Vapor pressure : 1.63 bar (23.7 psi) (at 20°C (68°F))
- Relative vapor density at 20 °C : No data available
- Relative density : 0.63
- Relative gas density : 2.6
- Solubility : Water: Completely soluble.
- Log Pow : Not applicable for inorganic gases.
- Log Kow : No data available
- Viscosity, kinematic : Not applicable.
- Viscosity, dynamic : Not applicable.
- Explosive properties : MAY FORM EXPLOSIVE MIXTURES WITH AIR.
- Oxidizing properties : None.

Trimethylsilane

Safety Data Sheet P-6301

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Explosion limits : No data available

9.2. Other information

Gas group : Liquefied gas
Additional information : Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level

SECTION 10: Stability and reactivity

10.1. Reactivity

May react with water to form methane, which is flammable. This product reacts with air to produce silica dust.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

May occur.

10.4. Conditions to avoid

Air contact. Moisture. High temperature.

10.5. Incompatible materials

Halogens. Oxidizing agents. **Liberates hydrogen gas, which is flammable, on contact with:** Alcohols. alkalis. Acids. metals. Metallic compounds.

10.6. Hazardous decomposition products

Decomposition at temperatures above 500°C (932°F) may release silicon carbonate and hydrogen.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Trimethylsilane (f)993-07-7

LC50 inhalation rat (ppm)	9600 ppm/1h
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Skin corrosion/irritation : CAUSES SKIN IRRITATION.

pH: Not applicable.

Serious eye damage/irritation : CAUSES SERIOUS EYE IRRITATION.

pH: Not applicable.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

Symptoms/injuries after inhalation : MAY CAUSE RESPIRATORY IRRITATION.

Symptoms/injuries after skin contact : MAY CAUSE SKIN IRRITATION.

Symptoms/injuries after eye contact : MAY CAUSE EYE IRRITATION.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No data available.

12.2. Persistence and degradability

Trimethylsilane (993-07-7)	
Persistence and degradability	No data available.

12.3. Bioaccumulative potential

Trimethylsilane (993-07-7)	
Log Pow	Not applicable for inorganic gases.
Bioaccumulative potential	No data available.

12.4. Mobility in soil

Trimethylsilane (993-07-7)	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Other adverse effects

Effect on ozone layer	: None
Effect on the global warming	: No known effects from this product

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal recommendations	: Do not attempt to dispose of residual or unused quantities. Return container to supplier.
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SECTION 14: Transport information

In accordance with DOT	
Transport document description	: UN3161 Liquefied gas, flammable, n.o.s., 2.1
UN-No.(DOT)	: UN3161
Proper Shipping Name (DOT)	: Liquefied gas, flammable, n.o.s.
Class (DOT)	: 2.1 - Class 2.1 - Flammable gas 49 CFR 173.115
Hazard labels (DOT)	: 2.1 - Flammable gas



DOT Symbols	: G - Identifies proper shipping name (PSN) requiring the addition of technical name(s) in parentheses following the PSN
DOT Special Provisions (49 CFR 172.102)	: T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter

Additional information

Other information	: No supplementary information available.
Special transport precautions	: Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers: - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

Transport by sea

UN-No. (IMDG)	: 3161
Class (IMDG)	: 2 - Gases
MFAG-No	: 115

Air transport

UN-No. (IATA)	: 3161
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Class (IATA) : 2
Civil Aeronautics Law : Gases under pressure/Gases flammable under pressure

SECTION 15: Regulatory information

15.1. US Federal regulations

Trimethylsilane (993-07-7)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard Reactive hazard Sudden release of pressure hazard
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15.2. International regulations

CANADA

Trimethylsilane (993-07-7)

Listed on the Canadian NDSL (Non-Domestic Substances List)

EU-Regulations

Trimethylsilane (993-07-7)

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

15.2.2. National regulations

Trimethylsilane (993-07-7)

Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

15.3. US State regulations

Trimethylsilane(993-07-7)

U.S. - California - Proposition 65 - Carcinogens List	No
U.S. - California - Proposition 65 - Developmental Toxicity	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Female	No
U.S. - California - Proposition 65 - Reproductive Toxicity - Male	No

Trimethylsilane

Safety Data Sheet P-6301

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SECTION 16: Other information

Other information

: When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product

Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair, Inc, it is the user's obligation to determine the conditions of safe use of the product

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NFPA health hazard

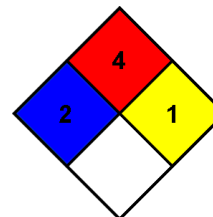
: 2 - Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given.

NFPA fire hazard

: 4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily.

NFPA reactivity

: 1 - Normally stable, but can become unstable at elevated temperatures and pressures or may react with water with some release of energy, but not violently.



HMIS III Rating

Health : 1 Slight Hazard - Irritation or minor reversible injury possible
 Flammability : 4 Severe Hazard
 Physical : 1 Slight Hazard

SDS US (GHS HazCom 2012) - Praxair

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.