

**TRIMETHOXYSilANE, 95%**

Safety Data Sheet SIT8392.0

Date of issue: 11/17/2014

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Version: 2.0

SECTION 1: Identification**1.1. Identification**

Product name : TRIMETHOXYSilANE, 95%
 Product code : SIT8392.0
 Product form : Substance
 Physical state : Liquid
 Formula : C₃H₁₀O₃Si
 Synonyms : TRIMETHOXYSilYL HYDRIDE
 Chemical family : ORGANOMETHOXYSilANE

1.2. Recommended use and restrictions on use

Recommended use : Chemical intermediate

1.3. Supplier**GELEST, INC.**

11 East Steel Road
 Morrisville, PA 19067
 USA

T 215-547-1015 - F 215-547-2484 - (M-F): 8:00 AM - 5:30 PM EST

info@gelest.com - www.gelest.com

1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)

SECTION 2: Hazard(s) identification**2.1. Classification of the substance or mixture****GHS-US classification**

Flammable liquids Category 2	H225 Highly flammable liquid and vapor
Acute toxicity (inhalation:vapor) Category 1	H330 Fatal if inhaled
Skin corrosion/irritation Category 2	H315 Causes skin irritation
Serious eye damage/eye irritation Category 1	H318 Causes serious eye damage
Specific target organ toxicity (single exposure) Category 3	H335 May cause respiratory irritation

Full text of H statements : see section 16

2.2. GHS Label elements, including precautionary statements**GHS US labeling**

Hazard pictograms (GHS US) :



Signal word (GHS US) : Danger

Hazard statements (GHS US) : H225 - Highly flammable liquid and vapor
 H315 - Causes skin irritation
 H318 - Causes serious eye damage
 H330 - Fatal if inhaled
 H335 - May cause respiratory irritation

Precautionary statements (GHS US) : P280 - Wear protective gloves/protective clothing/eye protection/face protection.
 P210 - Keep away from heat, open flames, sparks. - No smoking.
 P233 - Keep container tightly closed.
 P240 - Ground/Bond container and receiving equipment
 P241 - Use explosion-proof electrical equipment
 P242 - Use only non-sparking tools.
 P243 - Take precautionary measures against static discharge.
 P260 - Do not breathe vapors.
 P264 - Wash hands thoroughly after handling.
 P271 - Use only outdoors or in a well-ventilated area.
 P284 - [In case of inadequate ventilation] wear respiratory protection.
 P302+P352 - If on skin: Wash with plenty of water
 P303+P361+P353 - If on skin (or hair): take off immediately all contaminated clothing. rinse skin with water/shower
 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

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P310 - Immediately call a doctor
P332+P313 - If skin irritation occurs: Get medical advice/attention.
P362 - Take off contaminated clothing and wash before reuse.
P370+P378 - In case of fire: Use water spray or fog, foam, carbon dioxide, dry chemical to extinguish.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P403+P235 - Keep in a cool place
P405 - Store locked up.
P501 - Dispose of contents/container to licensed waste disposal facility.

2.3. Hazards not otherwise classified (HNOC)

Other hazards not contributing to the classification : Additional methanol may be formed by reaction with moisture and water. The US OSHA PEL (TWA) for methanol is 200 ppm.

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substances

Substance type : Multi-constituent
Name : TRIMETHOXYSILANE, 95%
CAS-No. : 2487-90-3

Name	Product identifier	%	GHS-US classification
Trimethoxysilane	(CAS-No.) 2487-90-3	95 - 100	Flam. Liq. 2, H225 Acute Tox. 1 (Inhalation:vapour), H330 Skin Irrit. 2, H315 Eye Dam. 1, H318 STOT SE 3, H335
Tetramethoxysilane	(CAS-No.) 681-84-5	1 - 5	Flam. Liq. 2, H225 Acute Tox. 1 (Inhalation:vapour), H330 Skin Irrit. 2, H315 Eye Dam. 1, H318 STOT SE 3, H335
Methoxychlorosilanes	(CAS-No.) Not found	1 - 5	Skin Corr. 1C, H314 Eye Dam. 1, H318

Full text of hazard classes and H-statements : see section 16

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general : Remove contaminated clothing and shoes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If possible show this sheet; if not available show packaging or label.

First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor/physician.

First-aid measures after skin contact : Wash with plenty of soap and water. Get medical advice/attention.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.

First-aid measures after ingestion : Never give anything by mouth to an unconscious person. Immediately call a poison center or doctor/physician.

4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects after inhalation : Fatal if inhaled. May cause respiratory irritation.

Symptoms/effects after skin contact : Causes skin irritation.

Symptoms/effects after eye contact : Causes serious eye damage. Even mild exposures can cause conjunctivitis and corneal scarring. Initial symptoms of exposure may include a "scratchy" feeling in the eyes. Trimethoxysilane causes severe eye injuries, as well as necrosis of corneal cells, which can progress long after exposure has ceased. These destructive effects resist treatment and permanent blindness is possible from exposure.

Symptoms/effects after ingestion : May be harmful if swallowed.

Chronic symptoms : On contact with water this compound liberates methanol which is known to have a chronic effect on the central nervous system.

4.3. Immediate medical attention and special treatment, if necessary

NOTE TO PHYSICIAN: This product reacts with water in the acid contents of the stomach to form methanol. The combination of visual disturbances, metabolic acidosis and formic acid in urine is evidence of methanol poisoning. The therapeutic intravenous administration of ethanol (10 mls/hour) allows methanol to be preferentially oxidized and reduces production of methanol metabolites. Acidosis must be treated with intravenous administration of sodium bicarbonate and methanol elimination may be increased by hemodialysis, as indicated. Treatment should be based on blood methanol levels and acid-base balance.

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SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Water fog. Water spray. Foam. Carbon dioxide. Dry chemical.
Unsuitable extinguishing media : Water.

5.2. Specific hazards arising from the chemical

Fire hazard : Highly flammable liquid and vapor. Irritating fumes and organic acid vapors may develop when material is exposed to elevated temperatures or open flame. Vapors of trimethoxysilane cause corneal injury and blindness on even short exposures.
Explosion hazard : May form flammable/explosive vapor-air mixture.

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Avoid exposure of eyes to vapors. Fire fighters must wear positive pressure self-contained breathing apparatus.
Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Avoid all eye and skin contact and do not breathe vapor and mist.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Eliminate every possible source of ignition. Use special care to avoid static electric charges.

6.1.1. For non-emergency personnel

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Equip cleanup crew with proper protection.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up : Clean up any spills as soon as possible, using an absorbent material to collect it. Sweep or shovel spills into appropriate container for disposal. Use only non-sparking tools.

6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed : Handle empty containers with care because residual vapors are flammable.
Precautions for safe handling : Avoid all eye and skin contact and do not breathe vapor and mist. Containers must be properly grounded before beginning transfer. Provide good ventilation in process area to prevent accumulation of vapors. Use only non-sparking tools. Use only outdoors or in a well-ventilated area. Check containers for pressure build-up, by periodically venting and then inerting with dry nitrogen.
Hygiene measures : Wash hands thoroughly after handling. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Proper grounding procedures to avoid static electricity should be followed. Ground/bond container and receiving equipment. Use explosion-proof electrical equipment.
Storage conditions : Keep container tightly closed.
Incompatible materials : Oxidizing agent.
Storage area : Store in a well-ventilated place. Store away from heat.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Tetramethoxysilane (681-84-5)		
ACGIH	ACGIH TWA (ppm)	1 ppm
NIOSH	NIOSH REL (TWA) (mg/m ³)	6 mg/m ³
NIOSH	NIOSH REL (TWA) (ppm)	1 ppm
Trimethoxysilane (2487-90-3)		
AIHA	WEEL TWA (ppm)	0.05 ppm

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8.2. Appropriate engineering controls

Appropriate engineering controls : Provide local exhaust or general room ventilation.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

Avoid all unnecessary exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

Hand protection:

Neoprene or nitrile rubber gloves

Eye protection:

Chemical worker's goggles must be worn. Safety glasses are not adequate eye protection. Contact lenses should not be worn

Skin and body protection:

Wear suitable protective clothing

Respiratory protection:

Wear respiratory protection. NIOSH-certified organic vapor (black cartridge) respirator.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Clear liquid.
Molecular mass	: 122.2 g/mol
Color	: No data available
Odor	: Characteristic. Slight. Antiseptic. Floral.
Odor threshold	: No data available
Refractive index	: 1.3687
pH	: No data available
Relative evaporation rate (butyl acetate=1)	: > 1
Melting point	: -114 °C
Freezing point	: No data available
Boiling point	: 86 - 87 °C
Flash point	: -24 °C
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: Highly flammable liquid and vapor
Vapor pressure	: > 25 mm Hg
Relative vapor density at 20 °C	: > 4
Relative density	: 0.86
% Volatiles	: 100 %
Solubility	: Reacts with water.
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Explosion limits	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable.

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10.3. Possibility of hazardous reactions

Material decomposes slowly in contact with moist air or with water liberating methanol. Strong bases including amines can cause disproportion of this material to pyrophoric products. Platinum, platinum and iron salts and other Lewis acids can cause generation of flammable hydrogen gas in the presence of moisture.

10.4. Conditions to avoid

Heat. Open flame. Sparks.

10.5. Incompatible materials

Oxidizing agent.

10.6. Hazardous decomposition products

Methanol. Organic acid vapors. Silicon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

TRIMETHOXSILANE, 95% (2487-90-3)	
LD50 oral rat	1560 µl/kg
ATE US (vapors)	0.055 mg/l/4h
Tetramethoxysilane (681-84-5)	
LD50 dermal rabbit	17 ml/kg
LC50 inhalation rat (mg/l)	0.393 mg/l/4h
LDLo oral rat	700 mg/kg
LCLo inhalation rat	250 ppm/4h
LCLo inhalation mouse	1000 mg/m ³ /10M
ATE US (vapors)	0.393 mg/l/4h
ATE US (dust, mist)	0.393 mg/l/4h
Trimethoxysilane (2487-90-3)	
LD50 oral rat	8024 mg/kg
LD50 dermal rat	6300 µl/kg
LC50 inhalation rat (ppm)	42 ppm/4h
ATE US (oral)	8024 mg/kg body weight
ATE US (gases)	42 ppmV/4h
ATE US (vapors)	0.05 mg/l/4h

Skin corrosion/irritation	: Causes skin irritation. Skin Irritation - rabbit: 500 mg open: mild irritant effect
Serious eye damage/irritation	: Causes serious eye damage. Eye Irritation - rabbit: 20 mg/24H: moderate irritation effect
Respiratory or skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity – single exposure	: May cause respiratory irritation. Under experimental conditions, the kidney was found to be the target organ. Overexposure can cause lung damage - pulmonary toxin.
Specific target organ toxicity – repeated exposure	: Not classified
Aspiration hazard	: Not classified
Potential Adverse human health effects and symptoms	: The hydrolysis product of this compound is methanol.
Symptoms/effects after inhalation	: Fatal if inhaled. May cause respiratory irritation.
Symptoms/effects after skin contact	: Causes skin irritation.
Symptoms/effects after eye contact	: Causes serious eye damage. Even mild exposures can cause conjunctivitis and corneal scarring. Initial symptoms of exposure may include a "scratchy" feeling in the eyes. Trimethoxysilane causes severe eye injuries, as well as necrosis of corneal cells, which can progress long after exposure has ceased. These destructive effects resist treatment and permanent blindness is possible from exposure.
Symptoms/effects after ingestion	: May be harmful if swallowed.

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Chronic symptoms	: On contact with water this compound liberates methanol which is known to have a chronic effect on the central nervous system.
Reason for classification	: RTECS Number: VV6750000

SECTION 12: Ecological information

12.1. Toxicity

No additional information available

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Effect on the ozone layer : No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods

Product/Packaging disposal recommendations	: Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility.
Additional information	: Handle empty containers with care because residual vapors are flammable.
Ecology - waste materials	: Avoid release to the environment.

SECTION 14: Transport information

14.1. UN number

UN-No.(DOT)	: NA9269
DOT NA no.	: NA9269

14.2. UN proper shipping name

Transport document description	: NA9269 Trimethoxysilane (TRIMETHOXSILANE), 6.1 (3), I
Proper Shipping Name (DOT)	: Trimethoxysilane (TRIMETHOXSILANE)
Class (DOT)	: 6.1 - Class 6.1 - Poisonous materials 49 CFR 173.132
Packing group (DOT)	: I - Great Danger
Hazard labels (DOT)	: 6.1 - Poison inhalation hazard 3 - Flammable liquid



DOT Packaging Non Bulk (49 CFR 173.xxx)	: 227
DOT Packaging Bulk (49 CFR 173.xxx)	: 244
DOT Packaging Exceptions (49 CFR 173.xxx)	: None
DOT Symbols	: D - Proper shipping name for domestic use only, or to and from Canada

14.3. Additional information

Emergency Response Guide (ERG) Number	: 132
Other information	: Domestic (US) Shipping Instructions Only.

Transport by sea

DOT Vessel Stowage Location	: E - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length, but is prohibited from carriage on passenger vessels in which the limiting number of passengers is exceeded.
DOT Vessel Stowage Other	: 40 - Stow "clear of living quarters"

Air transport

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)	: Forbidden
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DOT Quantity Limitations Cargo aircraft only (49 : Forbidden
CFR 175.75)

SECTION 15: Regulatory information

15.1. US Federal regulations

Tetramethoxysilane (681-84-5)

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

Trimethoxysilane (2487-90-3)

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

15.2. International regulations

CANADA

Tetramethoxysilane (681-84-5)

Listed on the Canadian DSL (Domestic Substances List)

WHMIS Classification

Class D Division 1 Subdivision A - Very toxic material causing immediate and serious toxic effects
Class D Division 2 Subdivision B - Toxic material causing other toxic effects

Trimethoxysilane (2487-90-3)

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

EU-Regulations

Tetramethoxysilane (681-84-5)

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

Trimethoxysilane (2487-90-3)

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

National regulations

Tetramethoxysilane (681-84-5)

Listed on the AICS (Australian Inventory of Chemical Substances)
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 the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Japanese Poisonous and Deleterious Substances Control Law
Listed on the Canadian IDL (Ingredient Disclosure List)
Listed on INSQ (Mexican National Inventory of Chemical Substances)

Trimethoxysilane (2487-90-3)

Listed on the AICS (Australian Inventory of Chemical Substances)
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 the Korean ECL (Existing Chemicals List)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican National Inventory of Chemical Substances)

15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

Tetramethoxysilane (681-84-5)

U.S. - Massachusetts - Right To Know List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

Trimethoxysilane (2487-90-3)

U.S. - New Jersey - Right to Know Hazardous Substance List

SECTION 16: Other information

Full text of H-phrases::

H225	Highly flammable liquid and vapor
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation

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H318	Causes serious eye damage
H330	Fatal if inhaled
H335	May cause respiratory irritation

Abbreviations and acronyms

: Abbreviations: ND: Not Determined, No Data; NA: Not Applicable; LD: Lethal Dose; LC: Lethal Concentration; ATE: Acute Toxicity Estimates; H: hour; °: °C unless otherwise stated; mm: millimeters Hg, torr; PEL: permissible exposure level; TWA: time weighted average; TLV: threshold limit value; TG: Test Guideline; NIOSH: National Institute for Occupational Safety and Health; IARC: International Agency for Research on Cancer; NTP: National Toxicology Program; HMIS: Hazardous Material Information System; CAS No.: Chemical Abstract Service Registration Number; EC No.: European Commission Registration Number; EC Index No.: European Commission Index Number; OECD: The Organisation for Economic Co-operation and Development; GHS: The Globally Harmonized System of Classification and Labelling; APF: Assigned Protection Factor.

Hazard Rating

Health : 4 Severe Hazard - Life-threatening, major or permanent damage may result from single or repeated overexposures

Flammability : 4 Severe Hazard - Flammable gases, or very volatile flammable liquids with flash points below 73 F, and boiling points below 100 F. Materials may ignite spontaneously with air. (Class IA)

Physical : 2 Moderate Hazard - Materials that are unstable and may undergo violent chemical changes at normal temperature and pressure with low risk for explosion. Materials may react violently with water or form peroxides upon exposure to air.

Prepared by safety and environmental affairs.

Date of issue: 11/17/2014 Revision date: 08/31/2015 Version: 2.0

SDS US (GHS HazCom 2012) - Custom

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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