TRICHLOROSILANE, 99.9+%

Safety Data Sheet SIT8155.1

Date of issue: 01/09/2015 Revision date: 11/18/2016 Version: 2.0

SECTION 1: Identification

1.1. Product identifier

Product name	:	TRICHLOROSILANE, 99.9+%
Product code	:	SIT8155.1
Product form	:	Substance
Physical state	:	Liquid
Formula	:	Cl3HSi
Synonyms	:	SILICOCHLOROFORM HYDROTRICHLOROSILANE SILICON CHLORIDE HYDRIDE TRICHLOROMONOSILANE
Chemical family	:	CHLOROSILANE

1.2. Recommended use of the chemical and restrictions on use

Recommended use	:	Chemical intermediate For research and industrial use only

1.3. Details of the supplier of the safety data sheet

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 1	H224
Substances and mixtures which in contact with water emit flammable gases Category 1	H260
Acute toxicity (oral) Category 4	H302
Acute toxicity (inhalation:vapor) Category 4	H332
Skin corrosion/irritation Category 1A	H314
Serious eye damage/eye irritation Category 1	H318
Specific target organ toxicity (single exposure) Category 2	H371

Full text of H statements : see section 16

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US) :

GHS02 GHS05 GHS07 GHS08

Signal word (GHS-US) : Danger

Hazard statements (GHS-US) :
H224 - Extremely flammable liquid and vapor
H260 - In contact with water releases flammable gases which may ignite spontaneously
H302+H332 - Harmful if swallowed or if inhaled
H314 - Causes severe skin burns and eye damage
H318 - Causes serious eye damage
H371 - May cause damage to organs (respiratory system)

Precautionary statements (GHS-US) :
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P310 - Immediately call a doctor
P210 - Keep away from heat, sparks, open flames. - No smoking
P223 - Do not allow contact with water
P231 + P232 - Handle under inert gas. Protect from moisture
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
P270 - Do not eat, drink or smoke when using this product
P271 - Use only outdoors or in a well-ventilated area
P301 + P330 + P331 - If swallowed: rinse mouth. Do NOT induce vomiting
P301 + P312 - If swallowed: Call a doctor if you feel unwell
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
P312 - Call a doctor if you feel unwell
P321 - Specific treatment (see first aid instructions on this label)
P335 + P334 - Brush off loose particles from skin. Immerse in cool water/wrap in wet bandages
P363 - Wash contaminated clothing before reuse
P370 + P378 - In case of fire: Use foam, carbon dioxide, dry chemical to extinguish
P402 + P404 - Store in a dry place. Store in a closed container
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 : NOTE: Material may form a siloxane polymer on the skin, eyes or in the lungs. Hydrogen chloride may be formed by reaction with water and moisture in air. The US OSHA PEL (TWA) for hydrogen chloride is 5 ppm.

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/Information on ingredients

3.1. Substance

Substance type : Mono-constituent
Name : TRICHLOROSILANE, 99.9+%
CAS No : 10025-78-2

Name	Product identifier	%	GHS-US classification
Trichlorosilane	(CAS No) 10025-78-2	99.9 - 100	Flam. Liq. 1, H224 Water-react. 1, H260 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation:vapour), H332 Skin Corr. 1A, H314 Eye Dam. 1, H318 STOT SE 2, H371

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

3.2. Mixture

Not applicable

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. Get medical advice/attention if you feel unwell.

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

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

Symptoms/injuries : Causes severe skin burns and eye damage. May cause damage to organs.

Symptoms/injuries after inhalation : Harmful if inhaled. May cause respiratory irritation. Danger of serious damage to health by prolonged exposure through inhalation.

Symptoms/injuries after skin contact : Causes (severe) skin burns.

Symptoms/injuries after eye contact : Causes serious eye damage.

Symptoms/injuries after ingestion : Harmful if swallowed. Swallowing a small quantity of this material will result in serious health hazard.

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 : Alcohol-resistant foam. Carbon dioxide. Dry chemical. Use of high expansion foam (100:1) is recommended to cover flames.

Unsuitable extinguishing media : Water.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Extremely flammable liquid and vapor. In contact with water releases flammable gases which may ignite spontaneously. Irritating fumes of hydrogen chloride and organic acid vapors may develop when material is exposed to water or open flame.

Explosion hazard : May form flammable/explosive vapor-air mixture.

5.3. Advice for firefighters

Firefighting instructions : Exercise caution when fighting any chemical fire. Water spray or fog should only be used to knock down hydrogen chloride vapors in areas downwind from the fire. Use only dry media to extinguish flames.

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

Protective equipment : Wear protective equipment as described in Section 8.

Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8: "Exposure controls/personal protection".

Emergency procedures : Stop release.

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

For containment : Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for cleaning up : Clean up any spills as soon as possible, using an absorbent material to collect it. 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. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep away from any possible contact with water, because of violent reaction and possible flash fire.

Precautions for safe handling : Avoid all eye and skin contact and do not breathe vapor and mist. Do not allow contact with water. Handle under inert gas. Protect from moisture. Ground/bond container and receiving equipment. Open carefully. Take precautionary measures against static discharge. Use only outdoors or in a well-ventilated area. Use only non-sparking tools.

Hygiene measures : Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof electrical equipment.

Storage conditions : Keep container tightly closed. Keep in a cool place. Containers can generate pressure during storage. Store in sealed containers under dry inert atmosphere. Store locked up.

Incompatible materials : Acids. Alcohols. Oxidizing agent. Moisture. Water.

Storage area : Store in a well-ventilated place. Store away from heat.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

TRICHLOROSILANE, 99.9+% (10025-78-2)		
AIHA	WEEL Ceiling (ppm)	0.5 ppm

Trichlorosilane (10025-78-2)		
AIHA	WEEL Ceiling (ppm)	0.5 ppm

8.2. Exposure controls

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

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 goggles or face shield. (Viton recommended). Contact lenses should not be worn.

Skin and body protection : Wear suitable protective clothing.

Respiratory protection : NIOSH-certified combination organic vapor/acid gas (yellow 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 : 135.45 g/mol

Color : Straw.

Odor : Acrid. Similar to hydrogen chloride.

Odor threshold : No data available

Refractive index : 1.4020

pH : No data available

Relative evaporation rate (butyl acetate=1) : 40

Melting point : No data available

Freezing point : -128 °C

Boiling point : 31.9 °C

Flash point : -13 °C

Critical temperature : 234 °C

Auto-ignition temperature : 215 °C

Decomposition temperature : No data available

Flammability (solid, gas) : Extremely flammable liquid and vapor,In contact with water releases flammable gases which may ignite spontaneously

Vapor pressure : 400 mm Hg @ 14.5°C; 2.5 mm Hg @ -70°C

Critical pressure : 37 atm

Relative vapor density at 20 °C : > 1

Relative density : 1.3417

VOC content : > 75 %

Solubility : Reacts violently with water.

Log Pow : No data available

Log Kow : No data available

Viscosity, kinematic : 0.23 cSt @ 25˚C

Viscosity, dynamic : No data available

Explosive properties : No data available

Oxidizing properties : No data available

Explosion limits : 6.9 - 70 vol % (lower; upper)

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 in sealed containers stored under a dry inert atmosphere.

10.3. Possibility of hazardous reactions

Reacts with water and moisture in air, liberating hydrogen chloride. Platinum, platinum and iron salts and other Lewis acids can cause generation of flammable hydrogen gas in the presence of moisture. Forms impact sensitive explosive mixtures with potassium permanganate.

10.4. Conditions to avoid

Heat. Open flame. Sparks.

10.5. Incompatible materials

Alcohols. Acids. Moisture. Oxidizing agent. Water.

10.6. Hazardous decomposition products

Hydrogen chloride. Organic acid vapors.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Oral: Harmful if swallowed. Inhalation:vapour: Harmful if inhaled.

TRICHLOROSILANE, 99.9+% (10025-78-2)	
ATE US (oral)	1030.000 mg/kg body weight
ATE US (vapors)	11.000 mg/l/4h

Trichlorosilane (10025-78-2)	
LD50 oral rat	1030 mg/kg
LC50 inhalation rat (ppm)	2767 ppm/1h
LC50 inhalation mouse (2 h)	1500 mg/m³
ATE US (oral)	1030.000 mg/kg body weight
ATE US (gases)	1383.500 ppmV/4h
ATE US (vapors)	11.000 mg/l/4h

Skin corrosion/irritation : Causes severe skin burns and eye damage.

Serious eye damage/irritation : Causes serious eye damage.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

None of the components in this product at concentrations >0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : May cause damage to organs (respiratory system).

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

Symptoms/injuries after inhalation : Harmful if inhaled. May cause respiratory irritation. Danger of serious damage to health by prolonged exposure through inhalation.

Symptoms/injuries after skin contact : Causes (severe) skin burns.

Symptoms/injuries after eye contact : Causes serious eye damage.

Symptoms/injuries after ingestion : Harmful if swallowed. Swallowing a small quantity of this material will result in serious health hazard.

Reason for classification : Expert judgment

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

Other adverse effects	:	This substance may be hazardous to the environment.
Effect on ozone layer	:	No additional information available
Effect on the global warming	:	No known effects from this product.
GWPmix comment	:	No known effects from this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Sewage disposal recommendations	:	Do not dispose of waste into sewer.
Waste 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)	:	1295
DOT NA no.		UN1295

14.2. UN proper shipping name

Transport document description	:	UN1295 Trichlorosilane, 4.3, I
Proper Shipping Name (DOT)	:	Trichlorosilane
Class (DOT)	:	4.3 - Class 4.3 - Dangerous when wet material 49 CFR 173.124
Packing group (DOT)	:	I - Great Danger
Hazard labels (DOT)	:	4.3 - Dangerous when wet 3 - Flammable liquid 8 - Corrosive

DOT Packaging Non Bulk (49 CFR 173.xxx)	:	201
DOT Packaging Bulk (49 CFR 173.xxx)	:	244
DOT Packaging Exceptions (49 CFR 173.xxx)	:	None

14.3. Additional information

Emergency Response Guide (ERG) Number	:	139
Other information	:	No supplementary information available.

Transport by sea

DOT Vessel Stowage Location	:	D - The material must be stowed ‘‘on deck only’’ 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 the material is prohibited on passenger vessels in which the limiting number of passengers is exceeded
DOT Vessel Stowage Other	:	21 - Segregation same as for flammable liquids,28 - Stow ‘‘away from’’ flammable liquids,40 - Stow ‘‘clear of living quarters’’,49 - Stow ‘‘away from’’ corrosives,100 - Stow ‘‘away from’’ flammable solids

Air transport

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

SECTION 15: Regulatory information

15.1. US Federal regulations

Trichlorosilane (10025-78-2)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

CANADA

Trichlorosilane (10025-78-2)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Trichlorosilane (10025-78-2)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances) Listed on ELINCS (European List of Notified Chemical Substances)

National regulations

Trichlorosilane (10025-78-2)
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)

15.3. US State regulations

Trichlorosilane (10025-78-2)
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

SECTION 16: Other information

Full text of H-phrases::

H224	Extremely flammable liquid and vapor
H260	In contact with water releases flammable gases which may ignite spontaneously
H302	Harmful if swallowed
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H332	Harmful if inhaled
H371	May cause damage to organs

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.: Chemcial 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.

HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

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: 01/09/2015 Revision date: 11/18/2016 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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