SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form: Mixture
Physical state: Gas
Product name: TRIFLUOROSILANE, 50-75%
Product code: SIT8373.0
Formula: HF3Si
Synonyms: TRIFLUOROSILYLHYDRIDE
Chemical family: SILICON COMPOUND

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

1.2.1. Relevant identified uses

Use of the substance/mixture: Chemical intermediate

1.2.2. Uses advised against

No additional information available

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

GELEST INC.
Fritz-Klatte-Strasse 8
65933 Frankfurt
Germany
T +49 (0) 69 3535106-500 - F +49 (0) 69 3535106-501 - (M-F): 8:00 AM - 4:00 PM
info@gelestde.com - www.gelestde.com

1.4. Emergency telephone number

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

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Gases under pressure: Compressed gas
Acute toxicity (inhalation:gas) Category 2
Skin corrosion/irritation, Category 1B
Serious eye damage/eye irritation, Category 1
Specific target organ toxicity — Single exposure, Category 3,
Respiratory tract irritation

Full text of H statements: see section 16

Adverse physicochemical, human health and environmental effects

No additional information available

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP): GHS05, GHS06
TRIFLUOROSILANE, 50-75%
Safety Data Sheet

Signal word (CLP): Danger
Hazardous ingredients: Trifluorosilane; Tetrafluorosilane

Hazard statements (CLP):
- H280 - Contains gas under pressure; may explode if heated.
- H314 - Causes severe skin burns and eye damage.
- H330 - Fatal if inhaled.
- H335 - May cause respiratory irritation.

Precautionary statements (CLP):
- P280 - Wear protective gloves/protective clothing/eye protection/face protection.
- P284 - In case of inadequate ventilation wear respiratory protection.
- P260 - Do not breathe gas.
- P264 - Wash hands thoroughly after handling.
- P310 - Immediately call a POISON CENTER or doctor/physician.
- P501 - Dispose of contents/container to licensed waste disposal facility.

2.3. Other hazards
Other hazards not contributing to the classification: Hydrogen fluoride may be formed by reaction with water and moisture in air. The US OSHA PEL (TWA) for hydrogen fluoride is 3 ppm.

SECTION 3: Composition/information on ingredients

3.1. Substances
Not applicable

3.2. Mixtures

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>Classification according to Regulation (EC) No. 1272/2008 [CLP]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trifluorosilane</td>
<td>(CAS-No.) 13465-71-9</td>
<td>50 - 75</td>
<td>Press. Gas (Comp.), H280 Skin Corr. 1B, H314 Eye Dam. 1, H318 STOT SE 3, H335</td>
</tr>
<tr>
<td>Tetrafluorosilane</td>
<td>(CAS-No.) 7783-61-1 (EC-No.) 232-015-5</td>
<td>25 - 50</td>
<td>Press. Gas (Liq.), H280 Acute Tox. 2 (Inhalation), H330 Acute Tox. 3 (Inhalation:gas), H331 Skin Corr. 1B, H314 Eye Dam. 1, H318 STOT SE 3, H335</td>
</tr>
</tbody>
</table>

Full text of H-statements: see section 16

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 person to fresh air and keep comfortable for breathing. If you feel unwell, seek medical advice.

First-aid measures after skin contact: Flush with water, then wash with saturated solution of sodium carbonate or 3% aqueous ammonia. 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/effects: Causes severe skin burns and eye damage.
Symptoms/effects after inhalation: Fatal if inhaled. May cause respiratory irritation. Danger of serious damage to health by prolonged exposure through inhalation.
Symptoms/effects after skin contact: Causes (severe) skin burns.
Symptoms/effects after eye contact: Causes serious eye damage.
Symptoms/effects after ingestion: May be harmful if swallowed.
Symptoms/effects upon intravenous administration: For ingestion, calcium gluconate intravenously and calcium lactate orally may be considered.
Chronic symptoms: Hydrofluoric acid, the hydrolysis product has demonstrated mutagenicity and teratogenicity in laboratory bioassay.
4.3. Indication of any immediate medical attention and special treatment needed
NOTE TO PHYSICIAN: This product reacts with water and human tissues to form hydrofluoric acid. Massage a paste of 20% magnesium oxide in glycerol onto the burned areas. Inject 2-5 cc of 10% calcium gluconate beneath and around the burned areas. Gastric lavage, if swallowed, using 5% calcium chloride followed by saline catharsis.

SECTION 5: Firefighting measures
5.1. Extinguishing media
Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media : Water.

5.2. Special hazards arising from the substance or mixture
Fire hazard : Contains gas under pressure; may explode if heated. Irritating fumes, hydrogen fluoride and organic acid vapors may develop when material is exposed to moist air.

5.3. Advice for firefighters
Firefighting instructions : Exercise caution when fighting any chemical fire.
Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Avoid contact with skin and eyes. Do not breathe gas.
Other information : TRIFLUOROSILANE is not combustible.

SECTION 6: Accidental release measures
6.1. Personal precautions, protective equipment and emergency procedures
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".

6.2. Environmental precautions
Prevent entry to sewers and public waters. Notify authorities if product 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.

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
Precautions for safe handling : Avoid contact with skin and eyes. Do not breathe gas. Use only outdoors or in a well-ventilated area.
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
Storage conditions : Keep container tightly closed. Store locked up. Store in cylinders. Protect from sunlight. Store in a well-ventilated place.
Incompatible materials : Moisture, Water.
Storage area : Store in a well-ventilated place. Store away from heat.

7.3. Specific end use(s)
No additional information available

SECTION 8: Exposure controls/personal protection
8.1. Control parameters
No additional information available
8.2. Exposure controls

Appropriate engineering controls:
Handle in an enclosing hood with exhaust 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. Contact lenses should not be worn

Skin and body protection:
Wear suitable protective clothing

Respiratory protection:
Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. 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: Gas
Appearance: Colorless gas. Fumes in moist air.
Molecular mass: 86.09 g/mol
Colour: No data available
Odour: Pungent suffocating odor.
Odour threshold: No data available
Refractive index: No additional information available
pH: No data available
Relative evaporation rate (butylacetate=1): No data available
Melting point: No data available
Freezing point: -131 °C
Boiling point: -97.5 °C
Flash point: not flammable
Auto-ignition temperature: not combustible
Decomposition temperature: No data available
Flammability (solid, gas): No data available
Vapour pressure: 515 mm Hg @ -100°C
Relative vapour density at 20 °C: 3.63
Relative density: > 1 @ -100°C
% Volatiles: 100 %
Solubility: Reacts vigorously 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
Oxidising properties: No data available
Explosive limits: No data available

9.2. Other information

Gas group: Compressed gas

SECTION 10: Stability and reactivity

10.1. Reactivity
No additional information available

10.2. Chemical stability
Stable in sealed plastic containers.
TRIFLUOROSILANE, 50-75%
Safety Data Sheet

10.3. Possibility of hazardous reactions
Reacts with water and moisture in air liberating hydrogen fluoride.

10.4. Conditions to avoid
Avoid contact with aluminum, glass.

10.5. Incompatible materials
Moisture. Water.

10.6. Hazardous decomposition products
hydrofluoric acid. Hydrogen fluoride.

SECTION 11: Toxicological information

11.1. Information on toxicological effects
Acute toxicity: Fatal if inhaled.

TRIFLUOROSILANE, 50-75%
ATE CLP (gases) 200 ppmv/4h

Tetrafluorosilane (7783-61-1)

LC50 inhalation rat (ppm) 2272 ppmv/4h 3 days: Sense organs and special senses (nose, eye, ear, and taste): eye: lacrimation; lungs, thorax, or respiration: acute pulmonary edema; lungs, thorax, or respiration: dyspnea

ATE CLP (gases) 2272 ppmv/4h
ATE CLP (vapours) 0.5 mg/l/4h
ATE CLP (dust,mist) 0.05 mg/l/4h

Skin corrosion/irritation: Causes severe skin burns and eye damage.
Serious eye damage/irritation: Causes serious eye damage.
Respiratory or skin sensitisation: Not classified
Germ cell mutagenicity: Not classified
Carcinogenicity: Not classified
Reproductive toxicity: Not classified
STOT-single exposure: May cause respiratory irritation.
STOT-repeated exposure: Not classified
Aspiration hazard: Not classified
Potential adverse human health effects and symptoms: On contact with water and human tissue this compound liberates hydrogen fluoride (hydrofluoric acid).
Symptoms/effects after inhalation: Fatal if inhaled. May cause respiratory irritation. Danger of serious damage to health by prolonged exposure through inhalation.
Symptoms/effects after skin contact: Causes (severe) skin burns.
Symptoms/effects after eye contact: Causes serious eye damage.
Symptoms/effects after ingestion: May be harmful if swallowed.
Symptoms/effects upon intravenous administration: For ingestion, calcium gluconate intravenously and calcium lactate orally may be considered.
Chronic symptoms: Hydrofluoric acid, the hydrolysis product has demonstrated mutagenicity and teratogenicity in laboratory bioassay.
Reason for classification: Expert judgment

SECTION 12: Ecological information

12.1. Toxicity
Acute aquatic toxicity: Not classified
Chronic aquatic toxicity: Not classified

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. Results of PBT and vPvB assessment
No additional information available
12.6. Other adverse effects
Other adverse effects: This substance may be hazardous to the environment.

SECTION 13: Disposal considerations
13.1. Waste treatment methods
Sewage disposal recommendations: Do not dispose of waste into sewer.
Product/Packaging disposal recommendations: Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility.
Ecology - waste materials: Avoid release to the environment.

SECTION 14: Transport information
14.1. UN number
In accordance with ADR / RID / IMDG / IATA / ADN

<table>
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<tr>
<th>UN-No. (ADR)</th>
<th>UN-No. (IMDG)</th>
<th>UN-No. (IATA)</th>
<th>UN-No. (ADN)</th>
<th>UN-No. (RID)</th>
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<td>3304</td>
<td>3304</td>
<td>3304</td>
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<td>3304</td>
</tr>
</tbody>
</table>

14.2. UN proper shipping name
Proper Shipping Name (ADR): COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.
Proper Shipping Name (IMDG): COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.
Proper Shipping Name (IATA): Compressed gas, toxic, corrosive, n.o.s.
Proper Shipping Name (ADN): COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.
Proper Shipping Name (RID): COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S.

Transport document description (ADR): UN 3304 COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. (TRIFLUOROSILANE, 50-75%), 2.3 (8), (C/D)
Transport document description (IMDG): UN 3304 COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. (TRIFLUOROSILANE, 50-75%), 2.3 (8)
Transport document description (IATA): UN 3304 Compressed gas, toxic, corrosive, n.o.s. (TRIFLUOROSILANE, 50-75%), 2.3 (8)
Transport document description (ADN): UN 3304 COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. (TRIFLUOROSILANE, 50-75%), 2.3 (8)
Transport document description (RID): UN 3304 COMPRESSED GAS, TOXIC, CORROSIVE, N.O.S. (TRIFLUOROSILANE, 50-75%), 2.3 (8)

14.3. Transport hazard class(es)
ADR
Transport hazard class(es) (ADR): 2.3 (8)
Danger labels (ADR): 2.3, 8

IMDG
Transport hazard class(es) (IMDG): 2.3 (8)
Danger labels (IMDG): 2.3, 8

IATA
Transport hazard class(es) (IATA): 2.3 (8)

ADN
## 14.4. Packing group

<table>
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<th>Packing group (ADR)</th>
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<tbody>
<tr>
<td>Packing group (IMDG)</td>
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</tr>
<tr>
<td>Packing group (IATA)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Packing group (ADN)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Packing group (RID)</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

## 14.5. Environmental hazards

| Dangerous for the environment | No          |
| Marine pollutant              | No          |
| Other information             | No supplementary information available |

## 14.6. Special precautions for user

### Overland transport

| Classification code (ADR) | 1TC         |
| Special provisions (ADR)  | 274         |
| Limited quantities (ADR)  | 0           |
| Excepted quantities (ADR) | E0          |
| Packing instructions (ADR) | P200        |
| Mixed packing provisions (ADR) | MP9     |

**Portable tank and bulk container instructions (ADR)**

| Tank code (ADR) | CxBH(M) |
| Special provisions (ADR) | TU6, TA4, TT9 |
| Vehicle for tank carriage | AT |
| Transport category (ADR) | 1 |
| Special provisions for carriage - Loading, unloading and handling (ADR) | CV9, CV10, CV36 |
| Special provisions for carriage - Operation (ADR) | S14 |
| Hazard identification number (Kemler No.) | 268 |
| Orange plates | 268 3304 |

**Tunnel restriction code (ADR)**

| C/D |

**EAC code**

| 2RE |

**APP code**

| B |

### Transport by sea

| Special provisions (IMDG) | 274 |
| Limited quantities (IMDG) | 0 |
TRIFLUOROSILANE, 50-75%
Safety Data Sheet

Excerpted quantities (IMDG): E0
Packing instructions (IMDG): P200
EmS-No. (Fire): F-C
EmS-No. (Spillage): S-U
Stowage category (IMDG): D
Stowage and handling (IMDG): SW2

- Air transport
PCA Limited quantities (IATA): Forbidden
PCA limited quantity max net quantity (IATA): Forbidden
PCA packing instructions (IATA): Forbidden
PCA max net quantity (IATA): Forbidden
CAO packing instructions (IATA): Forbidden
CAO max net quantity (IATA): Forbidden
Special provisions (IATA): A2
ERG code (IATA): 2CP

- Inland waterway transport
Classification code (ADN): 1TC
Special provisions (ADN): 274
Limited quantities (ADN): 0
Excepted quantities (ADN): E0
Equipment required (ADN): PP, EP, TOX, A
Ventilation (ADN): VE02
Number of blue cones/lights (ADN): 2

- Rail transport
Classification code (RID): 1TC
Special provisions (RID): 274
Limited quantities (RID): 0
Excepted quantities (RID): E0
Packing instructions (RID): P200
Mixed packing provisions (RID): MP9
Portable tank and bulk container instructions (RID): (M)
Tank codes for RID tanks (RID): CxBH(M)
Special provisions for RID tanks (RID): TU6, TU38, TE22, TE25, TA4, TT9
Transport category (RID): 1
Special provisions for carriage - Loading, unloading and handling (RID): CW9, CW10, CW36
Hazard identification number (RID): 268

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code
Not applicable

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.1.1. EU-Regulations
Contains no REACH substances with Annex XVII restrictions
Contains no substance on the REACH candidate list
Contains no REACH Annex XIV substances
Contains no REACH Annex XIV substances

% Volatiles: 100 %

15.1.2. National regulations
TRIFLUOROSILANE, 50-75%
Safety Data Sheet

Germany
Reference to AwSV : Water hazard class (WGK) 3, Highly hazardous to water (Classification according to AwSV, Annex 1)

Netherlands
SZW-lijst van kankerverwekkende stoffen : Tetrafluorosilane is listed
SZW-lijst van mutagene stoffen : Tetrafluorosilane is listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding : None of the components are listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : None of the components are listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling : None of the components are listed

Denmark
Danish National Regulations : Young people below the age of 18 years are not allowed to use the product

15.2. Chemical safety assessment
No additional information available

SECTION 16: Other information

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

Other information : Prepared by safety and environmental affairs.

Full text of H- and EUH-statements:

Acute Tox. 2 (Inhalation) : Acute toxicity (inhal.), Category 2
Acute Tox. 2 (Inhalation:gas) : Acute toxicity (inhalation:gas) Category 2
Acute Tox. 3 (Inhalation:gas) : Acute toxicity (inhalation:gas) Category 3
Eye Dam. 1 : Serious eye damage/eye irritation, Category 1
Press. Gas (Comp.) : Gases under pressure : Compressed gas
Press. Gas (Liq.) : Gases under pressure : Liquefied gas
Skin Corr. 1B : Skin corrosion/irritation, Category 1B
STOT SE 3 : Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation
H280 : Contains gas under pressure; may explode if heated.
H314 : Causes severe skin burns and eye damage.
H318 : Causes serious eye damage.
H330 : Fatal if inhaled.
H331 : Toxic if inhaled.
H335 : May cause respiratory irritation.

SDS EU (REACH Annex II) - Custom

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