SECTION 1: Identification

1.1. Product identifier

Product name: 4-BROMO-3,3,4,4-TETRAFLUOROBUTYLTRICHLOROSILANE
Product code: SIB1906.5
Product form: Substance
Physical state: Liquid
Formula: C4H4BrCl3F4Si
Synonyms: SILANE, (4-BROMO-3,3,4,4-TETRAFLUOROBUTYL)TRICHLORO-
Chemical family: ORGANOCHLOROSILANE

1.2. Recommended use of the chemical and restrictions on use

Recommended use: Chemical intermediate
For research 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 4 H227
Skin corrosion/irritation Category 1B H314
Serious eye damage/eye irritation Category 1 H318
Full text of H statements: see section 16

2.2. Label elements

GHS-US labeling
Hazard pictograms (GHS-US):

Signal word (GHS-US): Danger
Hazard statements (GHS-US):
H227 - Combustible liquid
H314 - Causes severe skin burns and eye damage
H318 - Causes serious eye damage
Precautionary statements (GHS-US):
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P210 - Keep away from heat, open flames, sparks. - No smoking
P260 - Do not breathe vapors
P264 - Wash hands thoroughly after handling
P301 + P330 + P331 - If swallowed: rinse mouth. Do NOT induce vomiting
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
P350+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a doctor
P321 - Specific treatment (see first aid instructions on this label)
P363 - Wash contaminated clothing before reuse
P370 + P378 - In case of fire: Use water spray, foam, carbon dioxide, dry chemical to extinguish
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:

- 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**: 4-BROMO-3,3,4,4-TETRAFLUOROBUTYLTRICHLOROSILANE
- **CAS No**: 1823925-40-1

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-Bromo-3,3,4,4-tetrafluorobutyltrichlorosilane</td>
<td>(CAS No) 1823925-40-1</td>
<td>97-100</td>
<td>Flam. Liq. 4, H227, Skin Corr. 1B, H314, Eye Dam. 1, H318</td>
</tr>
</tbody>
</table>

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. If you feel unwell, seek medical advice.

- **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.
- **Symptoms/injuries after inhalation**: May cause respiratory irritation.
- **Symptoms/injuries after skin contact**: Causes (severe) skin burns.
- **Symptoms/injuries after eye contact**: Causes serious eye damage.
- **Symptoms/injuries after ingestion**: May be harmful if swallowed.

#### 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**: Water spray. Foam. Carbon dioxide. Dry chemical.
- **Unsuitable extinguishing media**: Water.

#### 5.2. Special hazards arising from the substance or mixture

- **Fire hazard**: Combustible liquid. Irritating fumes of hydrogen chloride and organic acid vapors may develop when material is exposed to water or open flame.

#### 5.3. Advice for firefighters

- **Firefighting instructions**: Exercise caution when fighting any chemical fire. Use water spray to cool exposed surfaces.
- **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**: Remove ignition sources. Use special care to avoid static electric charges.

- **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 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**: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- **Precautions for safe handling**: Avoid all eye and skin contact and do not breathe vapor and mist. Ground/bond container and receiving equipment. 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

- **Storage conditions**: Keep container tightly closed. Keep in a cool place. Store locked up.
- **Storage area**: Store in a well-ventilated place. Store away from heat.

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

No additional information available

#### 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. 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

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Clear liquid.</td>
</tr>
<tr>
<td>Molecular mass</td>
<td>342.42 g/mol</td>
</tr>
<tr>
<td>Color</td>
<td>No data available</td>
</tr>
<tr>
<td>Odor</td>
<td>Acrid. Similar to hydrogen chloride.</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>Refractive index</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative evaporation rate (butyl acetate=1)</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point</td>
<td>No data available</td>
</tr>
<tr>
<td>Freezing point</td>
<td>&lt; 0 °C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>88 - 90 °C @ 25 mm Hg</td>
</tr>
<tr>
<td>Flash point</td>
<td>&gt; 65 °C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No data available</td>
</tr>
</tbody>
</table>
4-BROMO-3,3,4,4-TETRAFLUOROBUTYLTRICHLOROSILANE
Safety Data Sheet

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Combustible liquid</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative vapor density at 20 °C</td>
<td>&gt; 1</td>
</tr>
<tr>
<td>Relative density</td>
<td>1.805</td>
</tr>
<tr>
<td>Solubility</td>
<td>Reacts with water.</td>
</tr>
<tr>
<td>Log Pow</td>
<td>No data available</td>
</tr>
<tr>
<td>Log Kow</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosion limits</td>
<td>No data available</td>
</tr>
</tbody>
</table>

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
React with water and moisture in air, liberating hydrogen chloride.

10.4. Conditions to avoid
Heat. Open flame. Sparks.

10.5. Incompatible materials

10.6. Hazardous decomposition products

SECTION 11: Toxicological information

11.1. Information on toxicological effects

<table>
<thead>
<tr>
<th>Effect</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity</td>
<td>Not classified</td>
</tr>
<tr>
<td>Skin corrosion/iritation</td>
<td>Causes severe skin burns and eye damage.</td>
</tr>
<tr>
<td>Serious eye damage/iritation</td>
<td>Causes serious eye damage.</td>
</tr>
<tr>
<td>Respiratory or skin sensitization</td>
<td>Not classified</td>
</tr>
<tr>
<td>Germ cell mutagenicity</td>
<td>Not classified</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

Repertorotoxicity: 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: Causes (severe) skin burns.
Symptoms/injuries after eye contact: Causes serious eye damage.
Symptoms/injuries after ingestion: May be harmful if swallowed.
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
<table>
<thead>
<tr>
<th>Other adverse effects</th>
<th>Effect on ozone layer</th>
<th>Effect on the global warming</th>
<th>GWPmix comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>This substance may be hazardous to the environment.</td>
<td>No additional information available</td>
<td>No known effects from this product.</td>
<td>No known effects from this product.</td>
</tr>
</tbody>
</table>

### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods
<table>
<thead>
<tr>
<th>Sewage disposal recommendations</th>
<th>Waste disposal recommendations</th>
<th>Ecology - waste materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do not dispose of waste into sewer.</td>
<td>Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility.</td>
<td>Avoid release to the environment.</td>
</tr>
</tbody>
</table>

### SECTION 14: Transport information

#### 14.1. UN number
<table>
<thead>
<tr>
<th>UN-No.(DOT)</th>
<th>DOT NA no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2987</td>
<td>UN2987</td>
</tr>
</tbody>
</table>

#### 14.2. UN proper shipping name
<table>
<thead>
<tr>
<th>Transport document description</th>
<th>Proper Shipping Name (DOT)</th>
<th>Class (DOT)</th>
<th>Packing group (DOT)</th>
<th>Hazard labels (DOT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN2987 Chlorosilanes, corrosive, n.o.s. (4-BROMO-3,3,4,4-TETRAFLUOROBUTYLTRICHLOROSILANE), 8, II</td>
<td>Chlorosilanes, corrosive, n.o.s. (4-BROMO-3,3,4,4-TETRAFLUOROBUTYLTRICHLOROSILANE)</td>
<td>8 - Class 8 - Corrosive material 49 CFR 173.136</td>
<td>II - Medium Danger</td>
<td>8 - Corrosive</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>206</td>
<td>242</td>
<td>None</td>
</tr>
</tbody>
</table>

#### 14.3. Additional information
<table>
<thead>
<tr>
<th>Emergency Response Guide (ERG) Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>156</td>
</tr>
</tbody>
</table>

Other information: No supplementary information available.

#### Transport by sea
<table>
<thead>
<tr>
<th>DOT Vessel Stowage Location</th>
<th>DOT Vessel Stowage Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>C - The material must be stowed “on deck only” on a cargo vessel and on a passenger vessel</td>
<td>40 - Stow “clear of living quarters”</td>
</tr>
</tbody>
</table>

#### Air transport
<table>
<thead>
<tr>
<th>DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)</th>
<th>DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forbidden</td>
<td>30 L</td>
</tr>
</tbody>
</table>
4-BROMO-3,3,4,4-TETRAFLUOROBUTYLTRICHLOROSILANE

Safety Data Sheet

SECTION 15: Regulatory information

15.1. US Federal regulations

| 4-BROMO-3,3,4,4-TETRAFLUOROBUTYLTRICHLOROSILANE (1823925-40-1) | CAUTION: This material is supplied for research and development purposes subject to the R&D exemption under TSCA, 40 CFR 720.36, and must meet the requirements of the exemption, including supervision by a "technically qualified individual" as defined by 40 CFR 720.3(ee). The use of this material for "commercial purposes" as defined by 40 CFR 720.3(r) is not permitted in the United States |

| 4-Bromo-3,3,4,4-tetrafluorobutyltrichlorosilane (1823925-40-1) | Not listed on the United States TSCA (Toxic Substances Control Act) inventory |

15.2. International regulations

CANADA
No additional information available

EU-Regulations
No additional information available

National regulations
No additional information available

15.3. US State regulations
No additional information available

SECTION 16: Other information

Full text of H--phrases:

H227 Combustible liquid
H314 Causes severe skin burns and eye damage
H318 Causes serious eye damage

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.

HMIS III Rating

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

Flammability: 2 Moderate Hazard - Materials which must be moderately heated or exposed to high ambient temperatures before ignition will occur. Includes liquids having a flash point at or above 100 F but below 200 F. (Classes II & IIIA)

Physical: 1 Slight Hazard - Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors.

Prepared by safety and environmental affairs.

Date of issue: 09/28/2016 Version: 1.0

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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