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

1.1. Product identifier

Product form: Substance
Physical state: Liquid
Substance name: TRIMETHYLSILYL AZIDE, 96%
Product code: SIT8580.0
Formula: C₃H₉N₃Si
Synonyms: AZIDOTRIMETHYLSILANE; SILYLAZIDE, TRIMETHYL-; TRIMETHYLSILYL AZIDE
Chemical family: ORGANOAMINOSILANE

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

Use of the substance/mixture: 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: Hazards identification

2.1. Classification of the substance or mixture

Classification (GHS-US):
Flam. Liq. 3 H226
Acute Tox. 3 (Oral) H301
Acute Tox. 3 (Dermal) H311
Acute Tox. 3 (Inhalation: dust, mist) H331
Eye Irrit. 2A H319

Full text of H-phrases: see section 16

2.2. Label elements

GHS-US labeling
Hazard pictograms (GHS-US): GHS02 GHS06 GHS07

Signal word (GHS-US): Danger

Hazard statements (GHS-US): H226 - Flammable liquid and vapor
H301 + H311 + H331 - Toxic if swallowed, in contact with skin or if inhaled
H319 - Causes serious eye irritation

Precautionary statements (GHS-US):
P210 - Keep away from heat/sparks/open flames/hot surfaces. - 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
P261 - Avoid breathing vapors, mist
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
P280 - Wear eye protection, face protection, protective clothing, protective gloves
P301+P310 - If swallowed: Immediately call a doctor
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
P330 - Rinse mouth
P337+P313 - If eye irritation persists: Get medical advice/attention
P361 - Take off immediately all contaminated clothing
P363 - Wash contaminated clothing before reuse
P370+P378 - In case of fire: Use carbon dioxide (CO2), dry extinguishing powder 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. Other hazards
No additional information available

2.4. Unknown acute toxicity (GHS US)
No data available

SECTION 3: Composition/information on ingredients

3.1. Substance
Name:
TRIMETHYLSILYL AZIDE, 96%
CAS No: 4648-54-8
EC no: 225-078-5

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>Classification (GHS-US)</th>
</tr>
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<tbody>
<tr>
<td>Silane, azidotrimethyl-</td>
<td>(CAS No) 4648-54-8</td>
<td>&gt; 95</td>
<td>Flam. Liq. 3, H226</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Eye Irrit. 2A, H319</td>
</tr>
</tbody>
</table>

3.2. Mixture
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. If breathing is difficult, give oxygen. Immediately consult a doctor/medical service.

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 medical advice/attention.

First-aid measures after ingestion: Obtain emergency medical attention. Never give anything by mouth to an unconscious person.

4.2. Most important symptoms and effects, both acute and delayed
Symptoms/injuries after inhalation: Toxic if inhaled. Danger of serious damage to health by prolonged exposure through inhalation. Low levels of exposure will cause headaches, reddening of the skin, particularly the face. At slightly higher levels, palpitations, ataxia, weakness and cyanosis (blue-gray coloring of the skin, lips and fingernails) which is caused by lack of oxygen have been observed. Toxic effects in humans for hydrazoic acid (a hydrolysis product of this material) have been observed at 300 ppb. Hydrazoic acid is a potent vasodilator.

Symptoms/injuries after skin contact: Repeated exposure to this material can result in absorption through skin causing significant health hazard. Toxic in contact with skin.

Symptoms/injuries after eye contact: Causes serious eye irritation. Bloodshot eyes are a result of vapor contact by the eyes or inhalation.

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

Chronic symptoms: Sensitization to this material has been observed with repeated use.

4.3. Indication of any immediate medical attention and special treatment needed
NOTE TO PHYSICIAN: If cyanosis is evident, treat for cyanide poisoning. Provide oxygen. The effects fo hydrazoic acid poisoning are more readily reversed than cyanide, since azide binding to cytochromes and presumably hemoglobin appears to be reversible. Hypotension and hypertension have both been reported for compounds in this class.

SECTION 5: Firefighting measures

5.1. Extinguishing media
Suitable extinguishing media: Carbon dioxide. Dry chemical.
Unsuitable extinguishing media: Water. Foam. Toxic fumes of hydrazoic acid will develop when material is exposed to water.
TRIMETHYLSILYL AZIDE, 96%
Safety Data Sheet

5.2. Special hazards arising from the substance or mixture
Fire hazard: Flammable liquid and vapor. Irritating fumes and organic acid vapors may develop when material is exposed to elevated temperatures 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.
Protection during firefighting: Do not enter fire area without proper protective equipment, including respiratory protection. Firefighters must wear positive pressure self-contained breathing apparatus.
Other information: If no greater threat is present, this material should be allowed to burn, since combustion eliminates acute toxic potential.

SECTION 6: Accidental release measures
6.1. Personal precautions, protective equipment and emergency procedures
General measures: Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8). Remove ignition sources.
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: 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.
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. Handle in an enclosing hood with exhaust ventilation. Provide good ventilation in process area to prevent accumulation of vapors. Take precautionary measures against static discharge. Avoid contact with water.
Hygiene measures: Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.
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.
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: 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: Suggested glove materials are: Neoprene, Nitrile/butadiene rubber, Polyethylene, Ethyl vinyl alcohol laminate, PVC or vinyl. Be aware that the chemical may penetrate the gloves. Frequent changes are advisable.
Eye protection: Chemical goggles. Contact lenses should not be worn.
Skin and body protection: Wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure.
Respiratory protection: In case of insufficient ventilation, wear suitable respiratory equipment. Wear a self contained breathing apparatus.
SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- Physical state: Liquid
- Appearance: Clear.
- Molecular mass: 115.21 g/mol
- Color: Straw.
- Odor: Pungent.
- Odor threshold: No data available
- Refractive index: 1.4140
- pH: No data available
- Relative evaporation rate (butyl acetate=1): No data available
- Melting point: No data available
- Freezing point: -95 °C
- Boiling point: 95 - 96 °C
- Flash point: 30 °C
- Auto-ignition temperature: 300 °C
- Decomposition temperature: No data available
- Flammability (solid, gas): Flammable liquid and vapor
- Vapor pressure: ≈ 100 mm Hg
- Relative vapor density at 20 °C: No data available
- Relative density: 0.876
- VOC content: 100 %
- Solubility: Reacts.
- 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 in sealed containers stored under a dry inert atmosphere.

10.3. Possibility of hazardous reactions

Toxic fumes of hydrazoic acid will develop when material is exposed to water. Explosions have been observed on reaction of this compound with vinylsilanes. Can form explosive compounds on contact with monovalent heavy metals (lead, copper, silver, etc.).

10.4. Conditions to avoid

Open flame. Heat. Sparks.

10.5. Incompatible materials


10.6. Hazardous decomposition products

Hydrazoic Acid. Organic acid vapors.

SECTION 11: Toxicological information

11.1. Information on toxicological effects


<table>
<thead>
<tr>
<th>TRIMETHYLSILYL AZIDE, 96% (4648-54-8)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATE US (oral)</td>
</tr>
<tr>
<td>ATE US (dermal)</td>
</tr>
<tr>
<td>ATE US (dust, mist)</td>
</tr>
</tbody>
</table>

07/15/2015 EN (English US) SDS ID: SIT8580.0
TRIMETHYLSILYL AZIDE, 96%
Safety Data Sheet

Silane, azidotrimethyl- (4648-54-8)

<table>
<thead>
<tr>
<th>ATE US (oral)</th>
<th>100,000 mg/kg body weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATE US (dermal)</td>
<td>300,000 mg/kg body weight</td>
</tr>
<tr>
<td>ATE US (gases)</td>
<td>700,000 ppm V/4h</td>
</tr>
<tr>
<td>ATE US (vapors)</td>
<td>3.000 mg/l/4h</td>
</tr>
<tr>
<td>ATE US (dust, mist)</td>
<td>0.500 mg/l/4h</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation: Not classified
Serious eye damage/irritation: Causes serious eye irritation.
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

Potential Adverse human health effects and symptoms:
Toxic if swallowed. Toxic in contact with skin. Toxic if inhaled.

Symptoms/injuries after inhalation:
Toxic if inhaled. Danger of serious damage to health by prolonged exposure through inhalation. Low levels of exposure will cause headaches, reddening of the skin, particularly the face. At slightly higher levels, palpitations, ataxia, weakness and cyanosis (blue-gray coloring of the skin, lips and fingernails) which is caused by lack of oxygen have been observed. Toxic effects in humans for hydrazoic acid (a hydrolysis product of this material) have been observed at 300 ppb. Hydrazoic acid is a potent vasodilator.

Symptoms/injuries after skin contact:
Repeated exposure to this material can result in absorption through skin causing significant health hazard. Toxic in contact with skin.

Symptoms/injuries after eye contact:
Causes serious eye irritation. Bloodshot eyes are a result of vapor contact by the eyes or inhalation.

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

Chronic symptoms:
Sensitization to this material has been observed with repeated use.

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 ozone layer: No additional information available
Effect on the global warming: No known ecological damage caused by this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
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): 2929
DOT NA no.: UN2929

14.2. UN proper shipping name
Proper Shipping Name (DOT): Toxic liquids, flammable, organic, n.o.s.
TRIMETHYLSILYL AZIDE
TRIMETHYLSILYL AZIDE, 96%
Safety Data Sheet

Department of Transportation (DOT) Hazard Classes
- 6.1 - Class 6.1 - Poisonous materials 49 CFR 173.132

Hazard labels (DOT)
- 6.1 - Poison inhalation hazard
- 3 - Flammable liquid

DOT Symbols
- G - Identifies PSN requiring a technical name

Packing group (DOT)
- I - Great Danger

DOT Packaging Exceptions (49 CFR 173.xxx)
- None

DOT Packaging Non Bulk (49 CFR 173.xxx)
- 201

DOT Packaging Bulk (49 CFR 173.xxx)
- 243

14.3. Additional information
Other information
- No supplementary information available.

Transport by sea
DOT Vessel Stowage Location
- B - (i) 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; and (ii) “On deck only” on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this section is exceeded.

DOT Vessel Stowage Other
- 40 - Slow “clear of living quarters”

Air transport
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27)
- 1 L

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)
- 30 L

SECTION 15: Regulatory information

15.1. US Federal regulations
Silane, azidotrimethyl- (4648-54-8)
- Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations
Silane, azidotrimethyl- (4648-54-8)
- Listed on the AICS (Australian Inventory of Chemical Substances)
- Listed on the Canadian NDSL (Non-Domestic Substances List)
- Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
- Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
- Listed on the Japanese ISHL (Industrial Safety and Health Law)
- 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)

15.3. US State regulations
AZIDOTRIMETHYL SILANE (4648-54-8)

<table>
<thead>
<tr>
<th>State</th>
<th>Carcinogens List</th>
<th>Developmental Toxicity</th>
<th>Reproductive Toxicity - Female</th>
<th>Reproductive Toxicity - Male</th>
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</thead>
<tbody>
<tr>
<td>U.S. - California - Proposition 65</td>
<td>No</td>
<td>No</td>
<td>No</td>
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</tr>
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Silane, azidotrimethyl- (4648-54-8)

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<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
SECTION 16: Other information

Abbreviations and acronyms:

- ND: Not Determined, No Data
- NA: Not Applicable
- LD: Lethal Dose
- LC: Lethal Concentration
- ATE: Acute Toxicity Estimates
- °C: degree Celsius unless otherwise stated
- mm: millimeters
- 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: Organisation for Economic Co-operation and Development

Full text of H-phrases:

- Acute Tox. 3 (Dermal) Acute toxicity (dermal) Category 3
- Acute Tox. 3 (Inhalation) Acute toxicity (inhalation) Category 3
- Acute Tox. 3 (Inhalation:dust,mist) Acute toxicity (inhalation:dust,mist) Category 3
- Acute Tox. 3 (Oral) Acute toxicity (oral) Category 3
- Eye Irrit. 2A Serious eye damage/eye irritation Category 2A
- Flam. Liq. 3 Flammable liquids Category 3
- H226 Flammable liquid and vapor
- H301 Toxic if swallowed
- H311 Toxic in contact with skin
- H319 Causes serious eye irritation
- H331 Toxic if inhaled

HMIS III Rating

- Health: 4 Severe Hazard - Life-threatening, major or permanent damage may result from single or repeated overexposures
- Flammability: 3 Serious Hazard
- Physical: 2 Moderate Hazard

Prepared by safety and environmental affairs.

Date of issue: 07/15/2015  Version: 1.0

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

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