

**ISOBUTYLGERMANE**

Safety Data Sheet GEI6480

Date of issue: 05/23/2016

Version: 1.0

SECTION 1: Identification**1.1. Identification**

Product name : ISOBUTYLGERMANE
 Product code : GEI6480
 Product form : Substance
 Physical state : Liquid
 Formula : C₄H₁₂Ge
 Synonyms : ISOBUTYLGERMANIUM HYDRIDE
 Chemical family : ORGANOGERMANIUM

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

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
 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.
 P303+P361+P353 - If on skin (or hair): take off immediately all contaminated clothing. rinse skin with water/shower
 P370+P378 - In case of fire: Use water spray, foam, carbon dioxide, dry chemical to extinguish.
 P403+P235 - Keep in a cool place
 P501 - Dispose of contents/container to licensed waste disposal facility.

2.3. Hazards not otherwise classified (HNOC)

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients**3.1. Substances**

Substance type : Mono-constituent
 Name : ISOBUTYLGERMANE
 CAS-No. : 768403-89-0

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| Name | Product identifier | % | GHS-US classification |
|-----------------|-----------------------|----------|-----------------------|
| Isobutylgermane | (CAS-No.) 768403-89-0 | 95 - 100 | Flam. Liq. 2, H225 |

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. If you feel unwell, seek medical advice. |
| 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 | : Never give anything by mouth to an unconscious person. Get medical advice/attention. |

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

| | |
|-------------------------------------|--|
| Symptoms/effects after inhalation | : May cause irritation to the respiratory tract. |
| Symptoms/effects after skin contact | : May cause skin irritation. |
| Symptoms/effects after eye contact | : May cause eye irritation. |
| Symptoms/effects after ingestion | : No information available. |

4.3. Immediate medical attention and special treatment, if necessary

No additional information available

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

| | |
|--------------------------------|--|
| Suitable extinguishing media | : Water spray. Foam. Carbon dioxide. Dry chemical. |
| Unsuitable extinguishing media | : Do not use straight streams. |

5.2. Specific hazards arising from the chemical

| | |
|------------------|---|
| Fire hazard | : Highly flammable liquid and vapor. Can generate hydrogen gas if exposed to caustic solutions. 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. Special protective equipment and precautions for fire-fighters

| | |
|--------------------------------|---|
| 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 | : 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". |
|----------------------|--|

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. 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.

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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. |
| Precautions for safe handling | : Avoid all eye and skin contact and do not breathe vapor and mist. Ground/bond container and receiving equipment. Provide good ventilation in process area to prevent accumulation of vapors. Take precautionary measures against static discharge. 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. Do not store at elevated temperature. Refrigeration is recommended. Keep in a cool place. |
| Incompatible materials | : Oxidizing agent. |
| Storage area | : Store in a well-ventilated place. Store away from heat. Store in a cool area. |

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

No additional information available

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 goggles. 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 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 | : 132.78 g/mol |
| Color | : Straw. |
| Odor | : Mild. |
| Odor threshold | : No data available |
| Refractive index | : No data available |
| pH | : No data available |
| Relative evaporation rate (butyl acetate=1) | : > 1 |
| Melting point | : No data available |
| Freezing point | : -78 °C |
| Boiling point | : 68 °C |
| Flash point | : < 23 °C |
| Auto-ignition temperature | : No data available |
| Decomposition temperature | : No data available |
| Flammability (solid, gas) | : Highly flammable liquid and vapor |

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| | |
|---------------------------------|-----------------------|
| Vapor pressure | : No data available |
| Relative vapor density at 20 °C | : > 1 |
| Relative density | : 1.002 |
| % Volatiles | : 100 % |
| Solubility | : Insoluble in 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 at temperatures not exceeding 25°C for up to six months.

10.3. Possibility of hazardous reactions

Alkalai or base materials may cause the release of small quantities of hydrogen gas.

10.4. Conditions to avoid

Heat. Open flame. Sparks.

10.5. Incompatible materials

Oxidizing agent.

10.6. Hazardous decomposition products

Germanium oxides. Organic acid vapors.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

| | |
|--|--|
| Acute toxicity | : Not classified |
| Skin corrosion/irritation | : Not classified |
| Serious eye damage/irritation | : Not classified |
| 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 |
| Symptoms/effects after inhalation | : May cause irritation to the respiratory tract. |
| Symptoms/effects after skin contact | : May cause skin irritation. |
| Symptoms/effects after eye contact | : May cause eye irritation. |
| Symptoms/effects after ingestion | : No information available. |

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

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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

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.
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) : 1993
DOT NA no. UN1993

14.2. UN proper shipping name

Transport document description : UN1993 Flammable liquids, n.o.s. (ISOBUTYLGERMANE), 3, II
Proper Shipping Name (DOT) : Flammable liquids, n.o.s.
(ISOBUTYLGERMANE)
Class (DOT) : 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120
Packing group (DOT) : II - Medium Danger
Hazard labels (DOT) : 3 - Flammable liquid



DOT Packaging Non Bulk (49 CFR 173.xxx) : 202
DOT Packaging Bulk (49 CFR 173.xxx) : 242
DOT Packaging Exceptions (49 CFR 173.xxx) : 150
DOT Symbols : G - Identifies PSN requiring a technical name

14.3. Additional information

Emergency Response Guide (ERG) Number : 128
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.

Air transport

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 5 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 60 L

SECTION 15: Regulatory information

15.1. US Federal regulations

ISOBUTYLGERMANE (768403-89-0)

TSCA Exemption/Exclusion

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.

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Isobutylgermane (768403-89-0)

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

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

SECTION 16: Other information

Full text of H-phrases::

H225

Highly flammable liquid and vapor

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

: 2 Moderate Hazard - Temporary or minor injury may occur

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

: 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: 05/23/2016

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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