

**1,2-BIS(TRIETHOXSILYL)ETHANE**

Safety Data Sheet SIB1817.0

Date of issue: 03/11/2014

Revision date: 09/28/2015

Version: 2.2

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1. Product identifier**

| | |
|-----------------|--|
| Product form | : Substance |
| Physical state | : Liquid |
| Substance name | : 1,2-BIS(TRIETHOXSILYL)ETHANE |
| Product code | : SIB1817.0 |
| Formula | : C ₁₄ H ₃₄ O ₆ Si ₂ |
| Synonyms | : 4,4,7,7-TETRAETHOXY-3,8-DIOXA-4,7-DISILADECANE; HEXAETHOXYDISILETHYLENE; BSE |
| Chemical family | : ORGANOETHOXSILANE |

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)**

| | |
|--|------|
| Acute Tox. 3 (Oral) | H301 |
| Acute Tox. 4 (Dermal) | H312 |
| Eye Irrit. 2B | H320 |
| Full text of H-phrases: see section 16 | |

2.2. Label elements**GHS-US labeling**

Hazard pictograms (GHS-US)



GHS06

Signal word (GHS-US)

: Danger

Hazard statements (GHS-US)

: H301 - Toxic if swallowed
H312 - Harmful in contact with skin
H320 - Causes eye irritation

Precautionary statements (GHS-US)

: P280 - Wear protective gloves/protective clothing/eye protection/face protection
P264 - Wash hands thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P312 - Call a doctor if you feel unwell
P330 - Rinse mouth
P301+P310 - If swallowed: Immediately call a doctor
P302+P352 - If on skin: Wash with plenty of water
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337+P313 - If eye irritation persists: Get medical advice/attention
P362+P364 - Take off contaminated clothing and wash it before reuse
P405 - Store locked up
P321 - Specific treatment (see first aid instructions on this label)
P501 - Dispose of contents/container to licensed waste disposal facility.**2.3. Other hazards**

Other hazards not contributing to the

: The hydrolysis product of bis(triethoxysilyl)ethane is ethanol. Additional ethanol may be formed

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classification

by reaction with moisture and water. Ethanol is metabolized to acetaldehyde and acetic acid which in large quantities result in metabolic acidosis, CNS depression and death due to respiratory arrest. Overexposure to ethanol by skin absorption, inhalation or ingestion may have a narcotic effect (headache, nausea, drowsiness). The US OSHA PEL (TWA) for ethanol is 1000 ppm. This product contains ethanol which is classified as a carcinogen by IARC in alcoholic beverages.

2.4. Unknown acute toxicity (GHS US)

No data available

SECTION 3: Composition/information on ingredients

3.1. Substance

Substance type : Multi-constituent
Name : 1,2-BIS(TRIETHOXSILYL)ETHANE
CAS No : 16068-37-4
EC no : 240-212-2

| Name | Product identifier | % | Classification (GHS-US) |
|---------------------------------|---------------------|----------|---|
| 1,2-Bis(triethoxysilyl)ethane | (CAS No) 16068-37-4 | 95 - 100 | Acute Tox. 3 (Oral), H301 Acute Tox. 4 (Dermal), H312 Eye Irrit. 2B, H320 |
| 1,1-Bis(triethoxysilyl)ethane | (CAS No) Not found | 0 - 5 | Eye Irrit. 2B, H320 |
| 1,2-Bis(triethoxysilyl)ethylene | (CAS No) 87061-56-1 | 0 - 5 | Eye Irrit. 2A, H319 |

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 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. Call a POISON CENTER or doctor/physician if you feel unwell.

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

Symptoms/injuries after inhalation : May cause irritation to the respiratory tract.

Symptoms/injuries after skin contact : Harmful in contact with skin. May cause skin irritation.

Symptoms/injuries after eye contact : Causes eye irritation.

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

Chronic symptoms : On contact with water this compound liberates ethanol which is known to have a chronic effect on the central nervous system.

4.3. Indication of any immediate medical attention and special treatment needed

NOTE TO PHYSICIAN: This product reacts with water in the acid contents of the stomach to form ethanol.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray. Water fog. Alcohol-resistant foam. Carbon dioxide. Dry chemical.

Unsuitable extinguishing media : Do not use water or foam.

5.2. Special hazards arising from the substance or mixture

Fire hazard : Irritating fumes and organic acid vapors may develop when material is exposed to elevated temperatures or open flame.

5.3. Advice for firefighters

Firefighting instructions : Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire.

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.

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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 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.

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 all eye and skin contact and do not breathe vapor and mist. Provide good ventilation in process area to prevent accumulation of vapors.
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

- Storage conditions : Keep container tightly closed.
Incompatible materials : Oxidizing agent.
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

| 1,2-Bis(triethoxysilyl)ethane (16068-37-4) | | |
|--|----------------------|--|
| USA OSHA | OSHA PEL (TWA) (ppm) | 10 ppm (by analogy with tetraethoxysilane [78-10-4] a maximum exposure of 10ppm is recommended for this product) |

8.2. Exposure controls

- Appropriate engineering controls : Provide local exhaust or general room ventilation.
Personal protective equipment : Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Avoid all unnecessary 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 : 354.59 g/mol
Color : No data available
Odor : Slight.
Odor threshold : No data available
Refractive index : 1.4052
pH : No data available

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| | |
|---|----------------------|
| Relative evaporation rate (butyl acetate=1) | : No data available |
| Melting point | : -33 °C |
| Freezing point | : No data available |
| Boiling point | : 96 °C @ 0.3 mm Hg |
| Flash point | : 107 °C |
| Auto-ignition temperature | : No data available |
| Decomposition temperature | : No data available |
| Flammability (solid, gas) | : No data available |
| Vapor pressure | : 10 mm Hg @ 150°C |
| Relative vapor density at 20 °C | : > 1 |
| Relative density | : 0.957 |
| VOC content | : < 5 % |
| Solubility | : Reacts 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 |
| 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.

10.3. Possibility of hazardous reactions

Material decomposes slowly in contact with moist air or with water liberating ethanol. Hazardous polymerization will not occur.

10.4. Conditions to avoid

Heat. Sparks. Open flame.

10.5. Incompatible materials

Oxidizing agent.

10.6. Hazardous decomposition products

Ethanol. Organic acid vapors. Silicon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Oral: Toxic if swallowed. Dermal: Harmful in contact with skin.

1,2-Bis(triethoxysilyl)ethane (16068-37-4)

| | |
|--------------------|------------|
| LD50 oral rat | 161 mg/kg |
| LD50 dermal rabbit | 1971 mg/kg |

| | |
|--|---|
| Skin corrosion/irritation | : Not classified |
| Serious eye damage/irritation | : Causes eye irritation. Eye Irritation - rabbit: mild irritation |
| Respiratory or skin sensitization | : Not classified |
| Germ cell mutagenicity | : Not classified This material was not mutagenic in an Ames bacterial assay. |
| 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 |

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| | |
|---|---|
| Potential Adverse human health effects and symptoms | : This material slowly generates ethanol on contact with water and moisture in living tissues. Material generates ethanol on contact with water or moisture in skin, eyes and mucous membranes and has an irritating, dehydrating effect on overexposed tissue. |
| Symptoms/injuries after inhalation | : May cause irritation to the respiratory tract. |
| Symptoms/injuries after skin contact | : Harmful in contact with skin. May cause skin irritation. |
| Symptoms/injuries after eye contact | : Causes eye irritation. |
| Symptoms/injuries after ingestion | : Toxic if swallowed. Swallowing a small quantity of this material will result in serious health hazard. |
| Chronic symptoms | : On contact with water this compound liberates ethanol which is known to have a chronic effect on the central nervous system. |
| 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 ecological damage caused by this product. |

SECTION 13: Disposal considerations

13.1. Waste treatment methods

| | |
|---------------------------------|--|
| Sewage disposal recommendations | : Do not dispose of waste into sewer. |
| Waste disposal recommendations | : Incinerate. 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

| | |
|-------------|--------|
| UN-No.(DOT) | : 2810 |
| DOT NA no. | UN2810 |

14.2. UN proper shipping name

| | |
|----------------------------|---|
| Proper Shipping Name (DOT) | : TOXIC LIQUID, ORGANIC, N.O.S. (1,2-BIS(TRIETHOXSILYL)ETHANE) |
| Hazard labels (DOT) | : 6.1 - Poison |



| | |
|---|---|
| DOT Symbols | : G - Identifies PSN requiring a technical name |
| Packing group (DOT) | : III - Minor Danger |
| DOT Packaging Exceptions (49 CFR 173.xxx) | : 153 |
| DOT Packaging Non Bulk (49 CFR 173.xxx) | : 203 |
| DOT Packaging Bulk (49 CFR 173.xxx) | : 241 |

14.3. Additional information

| | |
|-------------------|---|
| Other information | : No supplementary information available. |
|-------------------|---|

Transport by sea

| | |
|-----------------------------|---|
| DOT Vessel Stowage Location | : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel. |
| DOT Vessel Stowage Other | : 40 - Stow "clear of living quarters" |

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Air transport

DOT Quantity Limitations Passenger aircraft/rail : 60 L
(49 CFR 173.27)

DOT Quantity Limitations Cargo aircraft only (49 : 220 L
CFR 175.75)

SECTION 15: Regulatory information

15.1. US Federal regulations

1,2-Bis(triethoxysilyl)ethane (16068-37-4)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

EPA TSCA Regulatory Flag

S - S - indicates a substance that is identified in a proposed or final Significant New Uses Rule.

1,2-Bis(triethoxysilyl)ethylene (87061-56-1)

Not listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

1,2-Bis(triethoxysilyl)ethane (16068-37-4)

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)

1,2-Bis(triethoxysilyl)ethylene (87061-56-1)

15.3. US State regulations

1,2-BIS(TRIETHOXSILYL)ETHANE(16068-37-4)

U.S. - California - Proposition 65 - Carcinogens List

No

U.S. - California - Proposition 65 - Developmental Toxicity

No

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

No

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

No

1,2-Bis(triethoxysilyl)ethane (16068-37-4)

U.S. - California - Proposition 65 - Carcinogens List

U.S. - California - Proposition 65 - Developmental Toxicity

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

No significance risk level (NSRL)

No

No

No

No

1,1-Bis(triethoxysilyl)ethane (Not found)

U.S. - California - Proposition 65 - Carcinogens List

U.S. - California - Proposition 65 - Developmental Toxicity

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

No significance risk level (NSRL)

No

No

No

No

1,2-Bis(triethoxysilyl)ethylene (87061-56-1)

U.S. - California - Proposition 65 - Carcinogens List

U.S. - California - Proposition 65 - Developmental Toxicity

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

No significance risk level (NSRL)

No

No

No

No

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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.

Full text of H-phrases::

| | |
|-----------------------|---|
| Acute Tox. 3 (Oral) | Acute toxicity (oral) Category 3 |
| Acute Tox. 4 (Dermal) | Acute toxicity (dermal) Category 4 |
| Eye Irrit. 2A | Serious eye damage/eye irritation Category 2A |
| Eye Irrit. 2B | Serious eye damage/eye irritation Category 2B |
| H301 | Toxic if swallowed |
| H312 | Harmful in contact with skin |
| H319 | Causes serious eye irritation |
| H320 | Causes eye irritation |

HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given
Flammability : 1 Slight Hazard
Physical : 1 Slight Hazard

Prepared by safety and environmental affairs.

Date of issue: 03/11/2014 Revision date: 09/28/2015 Version: 2.2

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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