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

1.1. Product identifier

Product form: Substance
Physical state: Liquid
Substance name: DI-n-BUTYLDICHLOROGERMANE, 95%
Product code: GED3200
Formula: C8H18Cl2Ge
Synonyms: DIBUTYLGERMANIUMDICHLORIDE; DIBUTYLDICHLOROGERMANE
Chemical family: ORGANOCHLOROGERMANE

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]
Acute toxicity (oral), Category 3 H301
Skin corrosion/irritation, Category 1B H314
Serious eye damage/eye irritation, Category 1 H318

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):

Signal word (CLP): Danger
Hazard statements (CLP): H301 - Toxic if swallowed.
H314 - Causes severe skin burns and eye damage.
DI-n-BUTYLDICHLOROGERMANE, 95%
Safety Data Sheet

Precautionary statements (CLP):
- P280 - Wear protective gloves/protective clothing/eye protection/face protection.
- P260 - Do not breathe vapours.
- P264 - Wash hands thoroughly after handling.
- P270 - Do not eat, drink or smoke when using this product.
- P301+P330+P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
- P301+P310 - IF SWALLOWED: Immediately call a doctor.

EUH-statements:
- EUH014 - Reacts violently with water.

2.3. Other hazards
No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances

<table>
<thead>
<tr>
<th>Substance type</th>
<th>DI-n-BUTYLDICHLOROGERMANE, 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Dibutyldichlorogermane</td>
</tr>
<tr>
<td>CAS-No.</td>
<td>4593-81-1</td>
</tr>
<tr>
<td>EC-No.</td>
<td>224-986-9</td>
</tr>
</tbody>
</table>

<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>Dibutyldichlorogermane</td>
<td>(CAS-No.) 4593-81-1  (EC-No.) 224-986-9</td>
<td>90 - 100</td>
<td>Acute Tox. 3 (Oral), H301 Skin Corr. 1B, H314 Eye Dam. 1, H318</td>
</tr>
<tr>
<td>Other Organogermaniums</td>
<td></td>
<td>0 - 10</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

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

First-aid measures after skin contact:
Wash with plenty of 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.

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

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

Symptoms/effects after skin contact:
Causes (severe) skin burns.

Symptoms/effects after eye contact:
Causes serious eye damage.

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

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:

Unsuitable extinguishing media:
Water.

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 to cool exposed surfaces. 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 vapour and mist.
**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 vapour and mist. Provide good ventilation in process area to prevent formation of vapour.

**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.

**Incompatible materials**
- 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:**
- 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

**Physical state**
- Liquid
DI-n-BUTYLDICHLOROGERMANE, 95%
Safety Data Sheet

Appearance : Colorless liquid.
Molecular mass : 257.73 g/mol
Colour : No data available
Odour : No data available
Odour threshold : No data available
Refractive index : 1.4724
pH : No data available
Relative evaporation rate (butylacetate=1) : No data available
Melting point : No data available
Freezing point : < 0 °C
Boiling point : 242 °C
Flash point : 107 °C
Auto-ignition temperature : No data available
Decomposition temperature : No data available
Flammability (solid, gas) : No data available
Vapour pressure : < 5 mm Hg @ 20 °C
Relative vapour density at 20 °C : > 1
Relative density : 1.208
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
Oxidising properties : No data available
Explosive 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.

10.3. Possibility of hazardous reactions
Contact with water or moisture slowly generates 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
Acute toxicity : Toxic if swallowed.

<table>
<thead>
<tr>
<th>DI-n-BUTYLDICHLOROGERMANE, 95% (4593-81-1)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ATE CLP (oral)</td>
<td>100 mg/kg bodyweight</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dibutyldichlorogermane (4593-81-1)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 oral rat</td>
<td>100 mg/kg</td>
</tr>
<tr>
<td>LDLo intraperitoneal rat</td>
<td>100 mg/kg</td>
</tr>
<tr>
<td>ATE CLP (oral)</td>
<td>100 mg/kg bodyweight</td>
</tr>
</tbody>
</table>

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
DI-n-BUTYLDICHLOROGERMANE, 95%
Safety Data Sheet

Carcinogenicity: Not classified
Reproductive toxicity: Not classified
STOT-single exposure: Not classified
STOT-repeated exposure: Not classified
Aspiration hazard: Not classified
Symptoms/effects after inhalation: May cause irritation to the respiratory tract.
Symptoms/effects after skin contact: Causes (severe) skin burns.
Symptoms/effects after eye contact: Causes serious eye damage.
Symptoms/effects after ingestion: Toxic if swallowed. Swallowing a small quantity of this material will result in serious health hazard.
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

14.1. UN number
UN-No. (ADR): 2922
UN-No. (IMDG): 2922
UN-No. (IATA): 2922
UN-No. (ADN): 2922
UN-No. (RID): 2922

14.2. UN proper shipping name
Proper Shipping Name (ADR): CORROSIVE LIQUID, TOXIC, N.O.S.
Proper Shipping Name (IMDG): CORROSIVE LIQUID, TOXIC, N.O.S.
Proper Shipping Name (IATA): Corrosive liquid, toxic, n.o.s.
Proper Shipping Name (ADN): CORROSIVE LIQUID, TOXIC, N.O.S.
Proper Shipping Name (RID): CORROSIVE LIQUID, TOXIC, N.O.S.
Transport document description (ADR): UN 2922 CORROSIVE LIQUID, TOXIC, N.O.S. (DI-n-BUTYLDICHLOROGERMANE), 8 (6.1), II, (E)
Transport document description (IMDG): UN 2922 CORROSIVE LIQUID, TOXIC, N.O.S. (DI-n-BUTYLDICHLOROGERMANE), 8 (6.1), II
Transport document description (IATA): UN 2922 Corrosive liquid, toxic, n.o.s. (DI-n-BUTYLDICHLOROGERMANE), 8 (6.1), II
Transport document description (ADN): UN 2922 CORROSIVE LIQUID, TOXIC, N.O.S. (DI-n-BUTYLDICHLOROGERMANE), 8 (6.1), II
## DI-n-BUTYLDICHLOROGERMANE, 95%

### Safety Data Sheet

<table>
<thead>
<tr>
<th>Transport document description (RID)</th>
<th>: UN 2922 CORROSIVE LIQUID, TOXIC, N.O.S. (DI-n-BUTYLDICHLOROGERMANE), II</th>
</tr>
</thead>
</table>

### 14.3. Transport hazard class(es)

<table>
<thead>
<tr>
<th>ADR</th>
<th>Transport hazard class(es) (ADR)</th>
<th>: 8 (6.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Danger labels (ADR)</td>
<td>: 8, 6.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IMDG</th>
<th>Transport hazard class(es) (IMDG)</th>
<th>: 8 (6.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Danger labels (IMDG)</td>
<td>: 8, 6.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IATA</th>
<th>Transport hazard class(es) (IATA)</th>
<th>: 8 (6.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hazard labels (IATA)</td>
<td>: 8, 6.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADN</th>
<th>Transport hazard class(es) (ADN)</th>
<th>: 8 (6.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Danger labels (ADN)</td>
<td>: 8, 6.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RID</th>
<th>Transport hazard class(es) (RID)</th>
<th>: 8 (6.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Danger labels (RID)</td>
<td>: 8, 6.1</td>
</tr>
</tbody>
</table>

### 14.4. Packing group

<table>
<thead>
<tr>
<th>Packing group (ADR)</th>
<th>: II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packing group (IMDG)</td>
<td>: II</td>
</tr>
<tr>
<td>Packing group (IATA)</td>
<td>: II</td>
</tr>
<tr>
<td>Packing group (ADN)</td>
<td>: II</td>
</tr>
<tr>
<td>Packing group (RID)</td>
<td>: II</td>
</tr>
</tbody>
</table>

### 14.5. Environmental hazards

| Dangerous for the environment | : No |

Print date: 10/04/2019  EN (English)  SDS ID: GED3200  6/9
DI-n-BUTYLDICHLOROGERMANE, 95%
Safety Data Sheet

14.6. Special precautions for user

- Overland transport
  Classification code (ADR) : CT1
  Special provisions (ADR) : 274
  Limited quantities (ADR) : 1 L
  Excepted quantities (ADR) : E2
  Packing instructions (ADR) : P001, IBC02
  Mixed packing provisions (ADR) : MP15
  Portable tank and bulk container instructions (ADR) : T7
  Portable tank and bulk container special provisions (ADR) : TP2
  Tank code (ADR) : L4BN
  Vehicle for tank carriage : AT
  Transport category (ADR) : 2
  Special provisions for carriage - Loading, unloading and handling (ADR) : CV13, CV28
  Hazard identification number (Kemler No.) : 86
  Orange plates : [Image]

  Tunnel restriction code (ADR) : E
  EAC code : 2X
  APP code : B

- Transport by sea
  Special provisions (IMDG) : 274
  Limited quantities (IMDG) : 1 L
  Excepted quantities (IMDG) : E2
  Packing instructions (IMDG) : P001
  IBC packing instructions (IMDG) : IBC02
  Tank instructions (IMDG) : T7
  Tank special provisions (IMDG) : TP2
  EmS-No. (Fire) : F-A
  EmS-No. (Spillage) : S-B
  Stowage category (IMDG) : B
  Stowage and handling (IMDG) : SW2
  Properties and observations (IMDG) : Causes burns to skin, eyes and mucous membranes. Toxic if swallowed, by skin contact or by inhalation.

- Air transport
  PCA Excepted quantities (IATA) : E2
  PCA Limited quantities (IATA) : Y840
  PCA limited quantity max net quantity (IATA) : 0.5L
  PCA packing instructions (IATA) : 851
  PCA max net quantity (IATA) : 1L
  CAO packing instructions (IATA) : 855
  CAO max net quantity (IATA) : 30L
  Special provisions (IATA) : A3
  ERG code (IATA) : 8P

- Inland waterway transport
  Classification code (ADN) : CT1
  Special provisions (ADN) : 274, 802
  Limited quantities (ADN) : 1 L
  Excepted quantities (ADN) : E2
DI-n-BUTYLDICHLOROGERMANE, 95%
Safety Data Sheet

Carriage permitted (ADN): T
Equipment required (ADN): PP, EP, TOX, A
Ventilation (ADN): VE02
Number of blue cones/lights (ADN): 2

- Rail transport
Classification code (RID): CT1
Special provisions (RID): 274
Limited quantities (RID): 1L
Excepted quantities (RID): E2
Packing instructions (RID): P001, IBC02
Mixed packing provisions (RID): MP15
Portable tank and bulk container instructions (RID): T7
Portable tank and bulk container special provisions (RID): TP2
Tank codes for RID tanks (RID): L4BN
Transport category (RID): 2
Special provisions for carriage - Loading, unloading and handling (RID): CW13, CW28
Colis express (express parcels) (RID): CE6
Hazard identification number (RID): 86

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
No REACH Annex XVII restrictions
DI-n-BUTYLDICHLOROGERMANE, 95% is not on the REACH Candidate List
DI-n-BUTYLDICHLOROGERMANE, 95% is not on the REACH Annex XIV List
DI-n-BUTYLDICHLOROGERMANE, 95% is not subject to REGULATION (EU) No 649/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 concerning the export and import of hazardous chemicals.

15.1.2. National regulations

Germany

Netherlands
SZW-lijst van kankerverwekkende stoffen: The substance is not listed
SZW-lijst van mutagene stoffen: The substance is not listed
NIET-limitelev lijst van voor de voortplanting giftige stoffen – Borstvoeding: The substance is not listed
NIET-limitelev lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid: The substance is not listed
NIET-limitelev lijst van voor de voortplanting giftige stoffen – Ontwikkeling: The substance is not 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:

<table>
<thead>
<tr>
<th>Acute Tox. 3 (Oral)</th>
<th>Acute toxicity (oral), Category 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Dam. 1</td>
<td>Serious eye damage/eye irritation, Category 1</td>
</tr>
<tr>
<td>Skin Corr. 1B</td>
<td>Skin corrosion/Irritation, Category 1B</td>
</tr>
<tr>
<td>H301</td>
<td>Toxic if swallowed.</td>
</tr>
<tr>
<td>H314</td>
<td>Causes severe skin burns and eye damage.</td>
</tr>
<tr>
<td>H318</td>
<td>Causes serious eye damage.</td>
</tr>
<tr>
<td>EUH014</td>
<td>Reacts violently with water.</td>
</tr>
</tbody>
</table>

SDS EU (REACH Annex II) - Custom

The information contained in this document has been gathered from reference materials and/or Gelest, Inc. test data and is to the best knowledge and belief of Gelest, Inc. accurate and reliable. Such information is offered solely for your consideration, investigation and verification. It is not suggested or guaranteed that the hazard precautions or procedures described are the only ones which exist. Gelest, Inc. makes no warranties, express or implied, with respect to the use of such information and assumes no responsibility therefore. Information on this safety data sheet is not intended to constitute a basis for product specifications.

© 2019 Gelest Inc. Morrisville, PA 19067