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-BUTYLDIACETOXYGERMANE, tech-90
- Product code: GED3150
- Formula: C12H24GeO4
- Synonyms: DIBUTYLDIACETOXYGERMANE, DIBUTYLGERMANIUMDIACETATE
- Chemical family: ORGANOGERMANE

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]
  - 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): GHS05

- Signal word (CLP): Danger
- Hazard statements (CLP): H314 - Causes severe skin burns and eye damage.
- Precautionary statements (CLP): P280 - Wear protective gloves/protective clothing/eye protection/face protection. P260 - Do not breathe vapours.
DI-n-BUTYLDIACETOXYGERMANE, tech-90
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2.3. Other hazards
Other hazards not contributing to the classification: The US ACGIH (TWA) for acetic acid is 10 ppm.

SECTION 3: Composition/information on ingredients

3.1. Substances
Substance type: Multi-constituent
Name: DI-n-BUTYLDIACETOXYGERMANE, tech-90
CAS-No.: 13971-75-0

<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>Di-n-butyldiacetoxygermane</td>
<td>(CAS-No.) 13971-75-0</td>
<td>90 - 100</td>
<td>Skin Corr. 1B, H314  Eye Dam. 1, H318</td>
</tr>
<tr>
<td>Other Organogermes</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: Causes severe skin burns and eye damage.
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: 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
Unsuitable extinguishing media: Do not use straight streams.

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: 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 vapour and mist.

Print date: 10/04/2019
SDS ID: GED3150
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.

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. Use only outdoors or in a well-ventilated area.
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.
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
Appearance : Liquid.
DI-n-BUTYLDIACETOXYGERMANE, tech-90
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<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular mass</td>
<td>304.9 g/mol</td>
</tr>
<tr>
<td>Colour</td>
<td>Colourless</td>
</tr>
<tr>
<td>Odour</td>
<td>characteristic</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>Refractive index</td>
<td>1.4452</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative evaporation rate (butylacetate=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>127 °C @ 5 mm Hg</td>
</tr>
<tr>
<td>Flash point</td>
<td>&gt; 110 °C</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>No data available</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>&lt; 1 mm Hg @ 20°C</td>
</tr>
<tr>
<td>Relative vapour density at 20 °C</td>
<td>&gt; 1</td>
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<tr>
<td>Relative density</td>
<td>1.444</td>
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<tr>
<td>Solubility</td>
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<td>Log Pow</td>
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<tr>
<td>Log Kow</td>
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<td>Viscosity, kinematic</td>
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<tr>
<td>Viscosity, dynamic</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive limits</td>
<td>No data available</td>
</tr>
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</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.

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
Bases. Reducing agents.

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: 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
Carcinogenicity: Not classified

Reproductive toxicity: Not classified
STOT-single exposure: Not classified
STOT-repeated exposure: Not classified

None of the components in this product at concentrations >0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.
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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: May be harmful if swallowed.

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) : 1760
UN-No. (IMDG) : 1760
UN-No. (IATA) : 1760
UN-No. (ADN) : 1760
UN-No. (RID) : 1760

14.2. UN proper shipping name
Proper Shipping Name (ADR) : CORROSIVE LIQUID, N.O.S.
Proper Shipping Name (IMDG) : CORROSIVE LIQUID, N.O.S.
Proper Shipping Name (IATA) : Corrosive liquid, n.o.s.
Proper Shipping Name (ADN) : CORROSIVE LIQUID, N.O.S.
Proper Shipping Name (RID) : CORROSIVE LIQUID, N.O.S.
Transport document description (ADR) : UN 1760 CORROSIVE LIQUID, N.O.S. (DI-n-BUTYLDIACETOXYGERMANE), 8, II, (E)
Transport document description (IMDG) : UN 1760 CORROSIVE LIQUID, N.O.S. (DI-n-BUTYLDIACETOXYGERMANE), 8, II
Transport document description (IATA) : UN 1760 Corrosive liquid, n.o.s. (DI-n-BUTYLDIACETOXYGERMANE), 8, II
Transport document description (ADN) : UN 1760 CORROSIVE LIQUID, N.O.S. (DI-n-BUTYLDIACETOXYGERMANE), 8, II
Transport document description (RID) : UN 1760 CORROSIVE LIQUID, N.O.S. (DI-n-BUTYLDIACETOXYGERMANE), 8, II

14.3. Transport hazard class(es)
ADR
Transport hazard class(es) (ADR) : 8
Danger labels (ADR) : 8
14.4. Packing group

<table>
<thead>
<tr>
<th>Classification</th>
<th>Group</th>
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<tbody>
<tr>
<td>ADR</td>
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<td>IMDG</td>
<td>II</td>
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<tr>
<td>IATA</td>
<td>II</td>
</tr>
<tr>
<td>ADN</td>
<td>II</td>
</tr>
<tr>
<td>RID</td>
<td>II</td>
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14.5. Environmental hazards

<table>
<thead>
<tr>
<th>Feature</th>
<th>Status</th>
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<tbody>
<tr>
<td>Dangerous for the environment</td>
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<tr>
<td>Marine pollutant</td>
<td>No</td>
</tr>
<tr>
<td>Other information</td>
<td>No supplementary information available</td>
</tr>
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</table>

14.6. Special precautions for user

- Overland transport

<table>
<thead>
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<th>Classification</th>
<th>Code</th>
</tr>
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<tr>
<td>Classification code (ADR)</td>
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</tr>
<tr>
<td>Special provisions (ADR)</td>
<td>274</td>
</tr>
</tbody>
</table>
### DI-n-BUTYLDIACETOXYGERMANE, tech-90
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<table>
<thead>
<tr>
<th>Limited quantities (ADR)</th>
<th>1l</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excepted quantities (ADR)</td>
<td>E2</td>
</tr>
<tr>
<td>Packing instructions (ADR)</td>
<td>P001, IBC02</td>
</tr>
<tr>
<td>Mixed packing provisions (ADR)</td>
<td>MP15</td>
</tr>
<tr>
<td>Portable tank and bulk container instructions (ADR)</td>
<td>T11</td>
</tr>
<tr>
<td>Portable tank and bulk container special provisions (ADR)</td>
<td>TP2, TP27</td>
</tr>
<tr>
<td>Tank code (ADR)</td>
<td>L4BN</td>
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<tr>
<td>Vehicle for tank carriage</td>
<td>AT</td>
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<td>Transport category (ADR)</td>
<td>2</td>
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<tr>
<td>Hazard identification number (Kemler No.)</td>
<td>80</td>
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<td>Orange plates</td>
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<tr>
<td>Tunnel restriction code (ADR)</td>
<td>E</td>
</tr>
<tr>
<td>EAC code</td>
<td>2X</td>
</tr>
<tr>
<td>APP code</td>
<td>B</td>
</tr>
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</table>

#### - 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)                   | T11  |
| Tank special provisions (IMDG)             | TP2, TP27 |
| 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. |

#### - 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)                            | 8L   |

#### - Inland waterway transport

| Classification code (ADN)                  | C9   |
| Special provisions (ADN)                  | 274  |
| Limited quantities (ADN)                  | 1 L  |
| Excepted quantities (ADN)                 | E2   |
| Carriage permitted (ADN)                  | T    |
| Equipment required (ADN)                  | PP, EP |
| Number of blue cones/lights (ADN)         | 0    |

#### - Rail transport

| Classification code (RID)                  | C9   |
| Special provisions (RID)                  | 274  |
| Limited quantities (RID)                  | 1L   |
| Excepted quantities (RID)                 | E2   |
| Packing instructions (RID)                | P001, IBC02 |
DI-n-BUTYLDIACETOXYGERMANE, tech-90
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Mixed packing provisions (RID) : MP15
Portable tank and bulk container instructions (RID) : T11
Portable tank and bulk container special provisions (RID) : TP2, TP27
Tank codes for RID tanks (RID) : L4BN
Transport category (RID) : 2
Colis express (express parcels) (RID) : CE6
Hazard identification number (RID) : 80

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-BUTYLDIACETOXYGERMANE, tech-90 is not on the REACH Candidate List
DI-n-BUTYLDIACETOXYGERMANE, tech-90 is not on the REACH Annex XIV List
DI-n-BUTYLDIACETOXYGERMANE, tech-90 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
12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

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

| Eye Dam. 1 | Serious eye damage/eye irritation, Category 1 |
| Skin Corr. 1B | Skin corrosion/Irritation, Category 1B |
| H314 | Causes severe skin burns and eye damage. |
| H318 | Causes serious eye damage. |
DI-n-BUTYLDIACETOXYGERMANE, tech-90
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SDS EU (REACH Annex II) - Custom

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