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

1.1. Product identifier

Product form : Substance
Physical state : Liquid
Substance name : ALUMINUM s-BUTOXIDE
Product code : AKA020
Formula : C12H27AlO3
Synonyms : ALUMINUM TRI-sec-BUTOXIDE
Chemical family : METAL ALCOHOLATE

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]

Flammable liquids, Category 3
Serious eye damage/eye irritation, Category 2

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) :

GHS02 GHS07

Signal word (CLP) : Warning
Hazard statements (CLP) : H226 - Flammable liquid and vapour.
H319 - Causes serious eye irritation.
Precautionary statements (CLP) : P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P264 - Wash hands thoroughly after handling.
**ALUMINUM s-BUTOXIDE**  
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P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
P240 - Ground/bond container and receiving equipment.  
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

### 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>Product identifier</th>
<th>%</th>
<th>Classification according to Regulation (EC) No. 1272/2008 [CLP]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>CAS-No.</td>
<td>EC-No.</td>
<td></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/….  
  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 eye contact:** Causes serious eye irritation.

- **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 : May cause skin irritation.
Symptoms/effects after eye contact : Causes serious eye irritation.
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

- **Suitable extinguishing media:** Foam. Carbon dioxide. Dry chemical.
- **Unsuitable extinguishing media:** Avoid water spray as 2-butanol will be generated.

#### 5.2. Special hazards arising from the substance or mixture

- **Fire hazard:** Flammable liquid and vapour. 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.
- **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

General measures
Remove ignition sources. Use special care to avoid static electric charges.

6.1.1. For non-emergency personnel
Evacuate unnecessary personnel.

6.1.2. For emergency responders
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
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.

SECTION 7: Handling and storage

7.1. 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. Containers and transfer lines require grounding during use. Do not allow vapors or dust to accumulate in work areas. Use only non-sparking tools.

Hygiene measures
Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities
Ground/bond container and receiving equipment.
Keep container tightly closed.
Water:
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

| 2-Butanol (78-92-2) | Austria MAK (mg/m³) | 150 mg/m³ |
| : | Austria MAK (ppm) | 50 ppm |
| : | Austria MAK Short time value (mg/m³) | 600 mg/m³ |
| : | Austria MAK Short time value (ppm) | 200 ppm |
| : | Belgium Limit value (mg/m³) | 307 mg/m³ |
| : | Belgium Limit value (ppm) | 100 ppm |
| : | France VME (mg/m³) | 300 mg/m³ |
| : | France VME (ppm) | 100 ppm |
| : | Greece OEL TWA (mg/m³) | 300 mg/m³ |
| : | Greece OEL TWA (ppm) | 100 ppm |
| : | Greece OEL STEL (mg/m³) | 450 mg/m³ |
| : | Greece OEL STEL (ppm) | 150 ppm |
| : | Italy - Portugal - USA ACGIH ACGIH TWA (ppm) | 100 ppm |
| : | Latvia OEL TWA (mg/m³) | 10 mg/m³ |
| : | USA IDLH US IDLH (ppm) | 2000 ppm |
| : | USA NIOSH NIOSH REL (TWA) (mg/m³) | 305 mg/m³ |
| : | USA NIOSH NIOSH REL (TWA) (ppm) | 100 ppm |
| : | USA NIOSH NIOSH REL (STEL) (mg/m³) | 455 mg/m³ |
| : | USA NIOSH NIOSH REL (STEL) (ppm) | 150 ppm |
| : | USA OSHA OSHA PEL (TWA) (mg/m³) | 450 mg/m³ |
| : | USA OSHA OSHA PEL (TWA) (ppm) | 150 ppm |
| : | Spain VLA-ED (mg/m³) | 308 mg/m³ |
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. Contact lenses should not be worn

Skin and body protection:
Wear suitable protective clothing
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Respiratory protection:
NIOSH-certified organic vapor (black cartridge) respirator.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Liquid. Viscous.</td>
</tr>
<tr>
<td>Molecular mass</td>
<td>246.32 g/mol</td>
</tr>
<tr>
<td>Colour</td>
<td>Pale yellow. Amber.</td>
</tr>
<tr>
<td>Odour</td>
<td>Slight odor of s-butanol.</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>Refractive index</td>
<td>1.438</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>&lt; 0 °C</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point</td>
<td>200 - 206 °C @ 30 mm Hg</td>
</tr>
<tr>
<td>Flash point</td>
<td>27 °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>Flammable liquid and vapour.</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative vapour density at 20 °C</td>
<td>&gt; 1</td>
</tr>
<tr>
<td>Relative density</td>
<td>0.9671</td>
</tr>
<tr>
<td>% Volatiles</td>
<td>&gt; 25 %</td>
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<tr>
<td>Solubility</td>
<td>Reacts with water.</td>
</tr>
<tr>
<td>Log Pow</td>
<td>No data available</td>
</tr>
<tr>
<td>Log Kow</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>No data available</td>
</tr>
<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>
</tbody>
</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
Material decomposes slowly in contact with air by reaction with moisture, liberating s-butanol and aluminum hydroxide.

10.4. Conditions to avoid
Heat. Open flame. Sparks.

10.5. Incompatible materials
Water:

10.6. Hazardous decomposition products

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity: Not classified

<table>
<thead>
<tr>
<th>Substance</th>
<th>LD50 oral rat (mg/kg)</th>
<th>LD50 dermal rabbit (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Butanol (78-92-2)</td>
<td>2200</td>
<td>&gt; 2000</td>
</tr>
</tbody>
</table>

Print date: 09/04/2019
EN (English)
SDS ID: AKA020
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Skin corrosion/irritation: Not classified
Serious eye damage/irritation: Causes serious eye irritation.
Respiratory or skin sensitisation: Not classified
Germ cell mutagenicity: 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: May cause skin irritation.
Symptoms/effects after eye contact: Causes serious eye irritation.
Symptoms/effects after ingestion: May be harmful if swallowed.
Reason for classification: Expert judgment

SECTION 12: Ecological information

12.1. Toxicity
Acute aquatic toxicity: Not classified
Chronic aquatic toxicity: Not classified

2-Butanol (78-92-2)
LC50 fish 1: 3380 - 3990 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1: 1859 - 7143 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])

12.2. Persistence and degradability
No additional information available

12.3. Bioaccumulative potential

2-Butanol (78-92-2)
Log Pow: 0.6

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
No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods
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): 1993
UN-No. (IMDG): 1993
UN-No. (IATA): 1993
UN-No. (ADN): 1993
UN-No. (RID): 1993

14.2. UN proper shipping name
Proper Shipping Name (ADR): FLAMMABLE LIQUID, N.O.S.
Proper Shipping Name (IMDG): FLAMMABLE LIQUID, N.O.S.
Proper Shipping Name (IATA): Flammable liquid, n.o.s.
Proper Shipping Name (ADN): FLAMMABLE LIQUID, N.O.S.
Proper Shipping Name (RID): FLAMMABLE LIQUID, N.O.S.
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14.3. Transport hazard class(es)

ADR
Transport hazard class(es) (ADR): 3
Danger labels (ADR): 3

IMDG
Transport hazard class(es) (IMDG): 3
Danger labels (IMDG): 3

IATA
Transport hazard class(es) (IATA): 3
Danger labels (IATA): 3

ADN
Transport hazard class(es) (ADN): 3
Danger labels (ADN): 3

RID
Transport hazard class(es) (RID): 3
Danger labels (RID): 3

14.4. Packing group
Packing group (ADR): III
Packing group (IMDG): III
Packing group (IATA): III
Packing group (ADN): III
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Packing group (RID) : III

14.5. Environmental hazards
Dangerous for the environment : No
Marine pollutant : No
Other information : No supplementary information available

14.6. Special precautions for user

- Overland transport
  Classification code (ADR) : F1
  Special provisions (ADR) : 274, 601, 640E
  Limited quantities (ADR) : 5l
  Excepted quantities (ADR) : E1
  Packing instructions (ADR) : P001, IBC03, LP01, R001
  Mixed packing provisions (ADR) : MP19
  Portable tank and bulk container instructions (ADR) : T4
  Portable tank and bulk container special provisions (ADR) : T4, TP29
  Tank code (ADR) : LGBF
  Vehicle for tank carriage : FL
  Transport category (ADR) : 3
  Special provisions for carriage - Packages (ADR) : V12
  Special provisions for carriage - Operation (ADR) : S2
  Hazard identification number (Kemler No.) : 30
  Orange plates : [Image]
  Tunnel restriction code (ADR) : D/E

- Transport by sea
  Special provisions (IMDG) : 223, 274, 955
  Limited quantities (IMDG) : 5 L
  Excepted quantities (IMDG) : E1
  Packing instructions (IMDG) : P001, LP01
  IBC packing instructions (IMDG) : IBC03
  Tank instructions (IMDG) : T4
  Tank special provisions (IMDG) : TP1, TP29
  EmS-No. (Fire) : F-E
  EmS-No. (Spillage) : S-E
  Stowage category (IMDG) : A

- Air transport
  PCA Excepted quantities (IATA) : E1
  PCA Limited quantities (IATA) : Y344
  PCA limited quantity max net quantity (IATA) : 10L
  PCA packing instructions (IATA) : 355
  PCA max net quantity (IATA) : 60L
  CAO packing instructions (IATA) : 366
  CAO max net quantity (IATA) : 220L
  Special provisions (IATA) : A3
  ERG code (IATA) : 3L

- Inland waterway transport
  Classification code (ADN) : F1
  Special provisions (ADN) : 274, 601, 640E
  Limited quantities (ADN) : 5 L
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**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

ALUMINUM s-BUTOXIDE is not on the REACH Candidate List

ALUMINUM s-BUTOXIDE is not on the REACH Annex XIV List

ALUMINUM s-BUTOXIDE 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.


% Volatiles : > 25 %

**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-list van kankerverwekkende stoffen : The substance is not listed

SZW-list van mutagene stoffen : The substance is not listed

NIET-limitatie lijst van voor de voortplanting giftige stoffen – Borstvoeding : The substance is not listed

NIET-limitatie lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : The substance is not listed

NIET-limitatie lijst van voor de voortplanting giftige stoffen – Ontwikkeling : The substance is not listed

**Denmark**

Class for fire hazard : Class II-1

Store unit : 5 liter

Classification remarks : R10 -H226;H319-; Emergency management guidelines for the storage of flammable liquids must be followed
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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>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Irrit. 2</td>
<td>Serious eye damage/eye irritation, Category 2</td>
</tr>
<tr>
<td>Flam. Liq. 3</td>
<td>Flammable liquids, Category 3</td>
</tr>
<tr>
<td>STOT SE 3</td>
<td>Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation</td>
</tr>
<tr>
<td>STOT SE 3</td>
<td>Specific target organ toxicity — Single exposure, Category 3, Narcosis</td>
</tr>
<tr>
<td>H226</td>
<td>Flammable liquid and vapour.</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation.</td>
</tr>
<tr>
<td>H335</td>
<td>May cause respiratory irritation.</td>
</tr>
<tr>
<td>H336</td>
<td>May cause drowsiness or dizziness.</td>
</tr>
</tbody>
</table>

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