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@gelestd.de - 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 according to Regulation (EC) No. 1272/2008 [CLP]
Flammable liquids, Category 3 - H226
Serious eye damage/eye irritation, Category 2 - H319
Full text of H- and EUH-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.  
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  
Contains no PBT/vPvB substances ≥ 0.1% assessed in accordance with REACH Annex XIII  

SECTION 3: Composition/information on ingredients  
3.1.  Substances  

<table>
<thead>
<tr>
<th>Substances</th>
<th>Substance type</th>
<th>Name</th>
<th>CAS-No.</th>
<th>EC-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mono-constituent</td>
<td>ALUMINUM s-BUTOXIDE</td>
<td>2269-22-9</td>
<td>218-871-2</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>Aluminum s-butoxide</td>
<td>(CAS-No.) 2269-22-9 (EC-No.) 218-871-2</td>
<td>&gt; 95</td>
<td>Flam. Liq. 3, H226 Eye Irrit. 2, H319</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/….  
| 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, 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  
Unsuitable extinguishing media : Avoid water spray as s-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.
ALUMINUM s-BUTOXIDE
Safety Data Sheet

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

Emergency procedures: Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment: 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

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 Section 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. 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

Technical measures: Ground/bond container and receiving equipment.

Storage conditions: Keep container tightly closed.

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. Contact lenses should not be worn

Skin and body protection:

Wear suitable protective clothing

Respiratory protection:

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: Liquid. Viscous.

Molecular mass: 246.32 g/mol
**ALUMINUM s-BUTOXIDE**

Safety Data Sheet

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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</thead>
<tbody>
<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>
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<tr>
<td>Vapour pressure</td>
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<tr>
<td>Relative volatility 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>
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<td>Partition coefficient n-octanol/water (Log Pow)</td>
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</tr>
<tr>
<td>Partition coefficient n-octanol/water (Log Kow)</td>
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</tr>
<tr>
<td>Viscosity, kinematic</td>
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<tr>
<td>Viscosity, dynamic</td>
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<tr>
<td>Explosive properties</td>
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<tr>
<td>Oxidising properties</td>
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<tr>
<td>Explosive limits</td>
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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
Skin corrosion/irritation : Not classified
Serious eye damage/irritation : Causes serious eye irritation.
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
Aspiration hazard : Not classified
Symptoms/effects after inhalation : May cause irritation to the respiratory tract.
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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
Hazardous to the aquatic environment, short-term (acute): Not classified
Hazardous to the aquatic environment, long-term (chronic): 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
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 / IMDG / IATA / ADN / RID

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.
Transport document description (ADR) : UN 1993 FLAMMABLE LIQUID, N.O.S. (ALUMINUM s-BUTOXIDE), 3, III, (D/E)
Transport document description (IMDG) : UN 1993 FLAMMABLE LIQUID, N.O.S. (ALUMINUM s-BUTOXIDE), 3, III
Transport document description (IATA) : UN 1993 Flammable liquid, n.o.s. (ALUMINUM s-BUTOXIDE), 3, III
Transport document description (ADN) : UN 1993 FLAMMABLE LIQUID, N.O.S. (ALUMINUM s-BUTOXIDE), 3, III
Transport document description (RID) : UN 1993 FLAMMABLE LIQUID, N.O.S. (ALUMINUM s-BUTOXIDE), 3, III

14.3. Transport hazard class(es)
ADR
Transport hazard class(es) (ADR) : 3
Danger labels (ADR) : 3
ALUMINUM s-BUTOXIDE
Safety Data Sheet

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### 14.4. Packing group

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</tr>
<tr>
<td>Packing group (IATA)</td>
<td>III</td>
</tr>
<tr>
<td>Packing group (ADN)</td>
<td>III</td>
</tr>
<tr>
<td>Packing group (RID)</td>
<td>III</td>
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</table>

### 14.5. Environmental hazards

- Dangerous for the environment: No
- Marine pollutant: No
- Other information: No supplementary information available

### 14.6. Special precautions for user

<table>
<thead>
<tr>
<th>Overland transport classification code (ADR)</th>
<th>F1</th>
</tr>
</thead>
</table>
# ALUMINUM s-BUTOXIDE

## Safety Data Sheet

### Special provisions (ADR)
- 274, 601, 640E

### Limited quantities (ADR)
- 5 l

### 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)
- TP1, 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

### 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)
- IBC03

#### 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

#### Excepted quantities (ADN)
- E1

#### Carriage permitted (ADN)
- T

#### Equipment required (ADN)
- PP, EX, A

#### Ventilation (ADN)
- VE01

#### Number of blue cones/lights (ADN)
- 0

### Rail transport

#### Classification code (RID)
- F1

#### Special provisions (RID)
- 274, 601, 640E

#### Limited quantities (RID)
- 5L

#### Excepted quantities (RID)
- E1
ALUMINUM s-BUTOXIDE
Safety Data Sheet

Packing instructions (RID) : P001, IBC03, LP01, R001
Mixed packing provisions (RID) : MP19
Portable tank and bulk container instructions (RID) : T4
Portable tank and bulk container special provisions (RID) : TP1, TP29
Tank codes for RID tanks (RID) : LGBF
Transport category (RID) : 3
Special provisions for carriage – Packages (RID) : W12
Colis express (express parcels) (RID) : CE4
Hazard identification number (RID) : 30

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

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

% Volatiles : > 25 %

15.1.2. National regulations

Germany
Regulatory reference : Not classified according to Regulation Governing Systems for Handling Substances Hazardous to Waters (AwSV)
Hazardous Incident Ordinance (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
SZW-lijst van reprotoxische stoffen – Borstvoeding : The substance is not listed
SZW-lijst van reprotoxische stoffen – Vruchtbareheid : The substance is not listed
SZW-lijst van reprotoxische 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

15.2. Chemical safety assessment
No additional information available

SECTION 16: Other information

Abbreviations and acronyms:
**ALUMINUM s-BUTOXIDE**

Safety Data Sheet

### 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 Irrit. 2 | Serious eye damage/eye irritation, Category 2 |
| Flam. Liq. 3 | Flammable liquids, Category 3 |
| H226 | Flammable liquid and vapour. |
| H319 | Causes serious eye irritation. |

### SDS EU (REACH Annex II) - Custom

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

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.