Aluminum Oxide, Al2O3

SECTION 1  IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Trade name  Aluminum Oxide, Al2O3
Synonyms  Ceralox High Purity Calcined Alumina - APA, AHPA, TSA, UHPA
Use  High Tech Industrial Applications, Raw material for chemical processes
Company  Sasol Chemicals (USA) LLC
(an affiliate of Sasol Chemicals North America LLC)
Address  12120 Wickchester Lane, Houston, TX 77079
Telephone  CHEMTREC North America Transportation Emergency (24-hr) (800) 424 9300
CHEMTREC World Wide (703) 527-3887
Other Emergencies (24-hr) (337) 494 5142
SDS and Product Information (8:00am-4:30pm CST) (281) 588 3491
Health and Safety Information (7:30am-4:00pm CST) (281) 588 3492
E-mail address  SasolElectronicSDS@us.sasol.com

SECTION 2  HAZARDS IDENTIFICATION

Not a hazardous substance or mixture according to OSHA HCS 2012.

SECTION 3  COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide (non-fibrous)</td>
<td>1344-28-1</td>
<td>99 - 100</td>
</tr>
</tbody>
</table>

See Section 8 for Exposure Guidelines and Section 15 for Regulatory Classifications.

SECTION 4  FIRST AID MEASURES

Eye contact  Rinse immediately with plenty of water for at least 15 minutes. If eye irritation persists, consult a specialist.
Skin contact  Wash off with plenty of water. Take off all contaminated clothing immediately. If skin irritation persists, call a physician. Wash contaminated clothing before re-use.
Inhalation  Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration. Call a physician immediately.
Ingestion  If swallowed, call a poison control centre or doctor immediately. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.
SAFETY DATA SHEET

Aluminum Oxide, Al2O3

SECTION 5    FIREFIGHTING MEASURES

FLAMMABLE PROPERTIES

Fire/explosion  This is an inert material and will not produce a dust explosion. Kst = 0. Non-flammable material

Suitable extinguishing media  The product is not flammable.

Protective equipment and precautions for firefighters  Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Further information  Do not allow run-off from fire fighting to enter drains or water courses.

SECTION 6    ACCIDENTAL RELEASE MEASURES

Methods and materials for containment and cleaning up  Clean up promptly by scoop or vacuum. Dispose of only in accordance with local, state, and federal regulations.

SECTION 7    HANDLING AND STORAGE

Safe handling advice  Ensure all equipment is electrically grounded before beginning transfer operations.

Storage/Transport pressure  Ambient

Load/Unload temperature  Ambient

Further information on storage conditions  Keep containers dry and tightly closed to avoid moisture absorption and contamination. Do not store wet product in aluminum containers due to corrosion and hydrogen generation.

SECTION 8    EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING MEASURES  Air contaminant levels should be controlled below the PEL or TLV for this product (see Exposure Guidelines).

PERSONAL PROTECTIVE EQUIPMENT

Eyes  Safety glasses with side-shields
Aluminum Oxide, Al2O3

**Skin**  Wear suitable protective clothing, gloves and eye/face protection.

**Inhalation**  Respirator must be worn if exposed to dust. Use NIOSH approved respiratory protection.

**EXPOSURE GUIDELINES**

<table>
<thead>
<tr>
<th>Components</th>
<th>Exposure limit(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide (non-fibrous)</td>
<td>OSHA PEL (Permissible Exposure Limit) 15 mg/m3 Total dust</td>
</tr>
<tr>
<td></td>
<td>OSHA PEL (Permissible Exposure Limit) 5 mg/m3 Respirable dust</td>
</tr>
<tr>
<td></td>
<td>ACGIH TLV (8-hour) 10 mg/m3 Total dust</td>
</tr>
<tr>
<td></td>
<td>ACGIH TLV (8-hour) 1 mg/m3 Respirable dust</td>
</tr>
<tr>
<td></td>
<td>The ACGIH TLV is for Aluminum metal and insoluble compounds.</td>
</tr>
</tbody>
</table>

PEL= Permissible Exposure Limits  
TLV= Threshold Limit Value  
EL= Excursion Limit  
TWA= Time Weighted Average (8 hr.)  
STEL= Short Term Exposure Limit (15 min.)  
WEEL= Workplace Environmental Exposure Level

**SECTION 9  PHYSICAL AND CHEMICAL PROPERTIES**

**Appearance**  solid  
**Colour**  white  
**Form**  compacts powder spheres  
**Odour**  odourless  
**Odour Threshold**  No data available  
**Flash point**  Not applicable  
**Flammability**  Upper explosion limit: Not applicable  
                      Lower explosion limit: Not applicable  
**Boiling point/boiling range**  2,977 °C, 5,391 °F;  
**Melting point/range**  2,050 °C, 3,722 °F;  
**Auto-ignition temperature**  No data available  
**Decomposition temperature**  No data available  
**Flammability (solid, gas)**  No data available  
**Vapour pressure**  1 mm Hg @ 2,158 °C, 3,916 °F;
Aluminum Oxide, Al2O3

- **Vapour density**: None.
- **Density**: >= 3.2 - 3.9 g/cm³ (crystallites)
- **Relative density**: No data available
- **Water solubility**: insoluble
- **Viscosity**: Not applicable
- **pH**: 8 - 9
- **Evaporation rate**: Not applicable
- **Partition coefficient: n-octanol/water**: No data available
- **Particle size**: 0.2 - 200 µm;
- **Surface area**: 1 - 250 m²/g;

### SECTION 10: STABILITY AND REACTIVITY

- **Reactivity**: Stable at normal ambient temperature and pressure.
- **Chemical stability**: No decomposition if stored and applied as directed.
- **Conditions to avoid**: None.
- **Hazardous decomposition products**: None.
- **Materials to avoid**: None.
- **Hazardous polymerisation**: None.

### SECTION 11: TOXICOLOGICAL INFORMATION

- **Additional Remarks**: The product itself has not been tested.
- **Acute dermal toxicity**: No data available
- **Acute inhalation toxicity**: Rats survived exposure to an aerosol of a similar product at a concentration of > 5 mg/l for four hours.
  This product may contain particles whose diameters are less than 1 micron.
  Direct injection of laboratory animals with finer alumina particles has resulted in
production of pulmonary fibrosis, a scarring of the tissue of the lung. 
To our knowledge, these effects have not been reported in humans. 
The human health significance of these animal studies is questionable given the unrealistic level and manner of exposure involved.

**Acute oral toxicity**  
LD50 Rat: > 5,000 mg/kg

**Skin corrosion/irritation**  
Primary irritation (Rabbit): 0.4 - 0.7 (Max. score is 8.0.)  
animals exposed for approximately 6 hours/day for 5 days showed no signs of skin irritation  
Human experience: Prolonged skin contact may cause skin irritation.

**Serious eye damage/eye irritation**  
Primary irritation (Rabbit): 7 - 10 (Max. score is 110.)

**Respiratory or skin sensitisation**  
No data available

**Germ cell mutagenicity**  
Genotoxicity in vitro:  
No data available

Genotoxicity in vivo:  
No data available

Assessment Mutagenicity:  
No data available

**Reproductive toxicity**  
Reproductive toxicity:  
No data available

Assessment Reproductive toxicity:  
No data available

Teratogenicity:  
No data available

Assessment teratogenicity:  
No data available

**STOT - single exposure**  
No data available

**STOT - repeated exposure**  
No data available

**Aspiration toxicity**  
No data available

**Carcinogenicity**  
Assessment carcinogenicity:  
Contains no ingredient listed as a carcinogen
SAFETY DATA SHEET

Aluminum Oxide, Al2O3

SECTION 12  ECOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatic toxicity</td>
<td>Product is an inorganic solid that is not bioavailable to aquatic biota and non-toxic.</td>
</tr>
<tr>
<td>Toxicity to fish</td>
<td>No data available</td>
</tr>
<tr>
<td>Toxicity to aquatic invertebrates</td>
<td>No data available</td>
</tr>
<tr>
<td>Toxicity to algae</td>
<td>No data available</td>
</tr>
<tr>
<td>Chronic toxicity to fish</td>
<td>No data available</td>
</tr>
<tr>
<td>Chronic toxicity to aquatic invertebrates</td>
<td>No data available</td>
</tr>
<tr>
<td>Biodegradation</td>
<td>The methods for determining biodegradability are not applicable to inorganic substances.</td>
</tr>
<tr>
<td>Bioaccumulative potential</td>
<td>No data available</td>
</tr>
<tr>
<td>Mobility in soil</td>
<td>No data available</td>
</tr>
<tr>
<td>Other adverse effects</td>
<td>No data available</td>
</tr>
</tbody>
</table>

SECTION 13  DISPOSAL CONSIDERATIONS

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste Code</td>
<td>Any unused product or empty containers may be disposed of as non-hazardous in accordance with state and federal requirements. Re-evaluation of the product may be required by the user at the time of disposal, since the product uses, transformations, mixtures, contamination, and spillage may change the classification. If the resulting material is determined to be hazardous, please dispose in accordance with state and federal (40 CFR 262) hazardous waste regulations.</td>
</tr>
<tr>
<td>Disposal methods</td>
<td>Dispose of only in accordance with local, state, and federal regulations.</td>
</tr>
<tr>
<td>Empty containers</td>
<td>Empty containers and original plastic liners may contain product residue. Handling of empty containers and liners should be in a manner to minimize dust generation. Safe handling procedures as outlined in the SDS should be followed at all times. Consult the appropriate official for information regarding disposal requirements.</td>
</tr>
</tbody>
</table>

SECTION 14  TRANSPORT INFORMATION

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT</td>
<td>not regulated</td>
</tr>
</tbody>
</table>
Aluminum Oxide, Al₂O₃

IATA  not regulated
IMDG  not regulated

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Remarks  No data available

SECTION 15  REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

TSCA Inventory Listing

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum oxide</td>
<td>1344-28-1</td>
</tr>
</tbody>
</table>

All chemical substances in this product are either on the TSCA Active Inventory, or in compliance with the inventory.

SARA 302 Status

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 311/312 Classification

Should this product meet EPCRA 311/312 Tier reporting criteria of 40 CFR 370, refer to Section 2 of this SDS for appropriate classification and Section 3 for components that meet the hazardous classification.

SARA 313 Chemical

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Weight percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>This material does</td>
<td></td>
<td></td>
</tr>
<tr>
<td>not contain any</td>
<td></td>
<td></td>
</tr>
<tr>
<td>chemical components</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with known CAS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>numbers that exceed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>the threshold (De</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimis)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>reporting levels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>established by SARA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Title III, Section</td>
<td></td>
<td></td>
</tr>
<tr>
<td>313.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

US. EPA CERCLA Hazardous Substances (40 CFR 302)

<table>
<thead>
<tr>
<th>Components</th>
<th>Reportable Quantity</th>
<th>Weight percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>none</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

INTERNATIONAL REGULATIONS

WHMIS Classification

Not a hazardous substance or mixture according to the Globally Harmonised System (GHS).

European Union

The product does not need to be labelled in accordance with EC directives or respective national laws. Directive 96/82/EC does not apply

Australia. Inventory of Chemical Substances (AICS)  Listed
Aluminum Oxide, Al₂O₃

Japan. Inventory of Existing and New Chemical Substances (ENCS) Listed
Japan. ISHL - Inventory of Chemical Substances Listed
Canada. Domestic Substances List (DSL) Inventory Listed
Canada. Non-Domestic Substance Listing (NDSL) Not listed
Philippines. Inventory of Chemicals / Chemical Substances (PICCS) Listed
Korea. Existing Chemicals Inventory (KECI) Listed
China. Inventory of Existing Chemical Substances (IECSC) Listed
Mexico. National Inventory of Chemical Substances (INSQ) Listed
New Zealand. Inventory of Chemical Substances (NZIoC) Listed
Switzerland. Inventory of Notified New Substances (CHINV) Listed
Taiwan. National Existing Chemical Inventory (NECI) Listed

Please note: The names and CAS numbers which are used for this product in the stated inventories may deviate from the information which is listed in Section 3.

STATE REGULATIONS

California Prop. 65
Components none
CAS-No.

SECTION 16 OTHER INFORMATION

HAZARD RATINGS

<table>
<thead>
<tr>
<th></th>
<th>Health</th>
<th>Flammability</th>
<th>Physical Hazard/ Instability</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMIS®</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>NFPA</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

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