

Aluminium hydroxide SDS/MSDS (Safety Data Sheet)

1. PRODUCT AND COMPANY IDENTIFICATION

Product identifier

- * Product Name: Aluminium hydroxide
- * Catalog Number: S4826
- * CAS Number: 21645-51-2
- * IUPAC Name: Aluminum hydroxide (Al(OH)₃)

Relevant identified uses and uses advised against

- * Identified uses: For research and development use only; laboratory chemicals; manufacture of substances.
- * Uses advised against: Not for pharmaceutical, household, or other unapproved uses.

Details of the supplier

- * Company: Selleck Chemicals
- * TollFree: +1 877 796-6397
- * Tel: +1 832 582-8158
- * Fax: +1 832 582-8590

Emergency telephone number

- * Emergency phone #: +1 832 582-8158

2. HAZARDS IDENTIFICATION

2.1 GHS classification in accordance with 29 CFR 1910 (OSHA HCS):

- Skin irritation: Category 2. H315
- Serious eye irritation: Category 2. H319
- Specific target organ toxicity (single exposure): Category 3. H335

2.2 GHS Label elements, including precautionary statements

Hazard Pictogram(s)



Signal Word

Warning

Hazard statement(s)

H315: Causes skin irritation
H319: Causes serious eye irritation
H335: May cause respiratory irritation

Precautionary statement(s)

None.

Prevention	P261: Avoid breathing dust/fume/gas/mist/vapors/spray. P264: Wash hands thoroughly after handling. P264+P265: Wash hands thoroughly after handling. Do not touch eyes. P271: Use only outdoors or in a well-ventilated area. P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
Response	P302+P352: IF ON SKIN: wash with plenty of water. P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing. P305+P351: IF IN EYES: Rinse cautiously with water for several minutes. P319: Get medical help if you feel unwell. P321: Specific treatment (see information on this label and safety datasheet)). P332+P317: If skin irritation occurs: Get medical help. P337+P317: If eye irritation persists: Get medical help. P338: Remove contact lenses, if present and easy to do. Continue rinsing. P362+P364: Take off contaminated clothing and wash it before reuse.
Storage	P403+P233: Store in a well-ventilated place. Keep container tightly closed. P405: Store locked up.
Disposal	P501: P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Other hazards

None.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Product name: Aluminium hydroxide
 CAS Number: 21645-51-2
 PubChem CID: 10176082
 Molecular formula: $\text{Al}(\text{OH})_3$
 Molecular weight: 78.004 g/mol
 IUPAC name: aluminum trihydroxide

3.2 Mixtures

Not applicable (pure substance).

4. FIRST-AID MEASURES

4.1 Description of first aid measures

Inhalation: Fresh air, rest.

Skin contact: Rinse skin with plenty of water or shower.

Eye contact: First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Ingestion: Rinse mouth. Rest.

4.2 Most important symptoms and effects, both acute and delayed

See Section 11 (Toxicological Information).

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically. Contact a poison control center or physician for severe exposure.

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable: Water spray, dry chemical, carbon dioxide (CO₂), alcohol-resistant foam.

Unsuitable: None known.

5.2 Specific hazards arising from the substance or mixture

In case of fire in the surroundings, use appropriate extinguishing media.

Stop flow of liquid before extinguishing fire. Use dry chemical or carbon dioxide. DO NOT use water as straight stream directly on spilled material. Water fog can be used to control fire. DO NOT use halogenated extinguishing agents on spilled material. Violent reaction may result. Use water spray to keep fire-exposed containers cool. Fight fire from protected location or maximum possible distance. /Aluminum Alkyls/

5.3 Advice for firefighters

Wear self-contained breathing apparatus (SCBA) and full protective clothing.

Fight fire from upwind. Cool containers with water spray until fire is extinguished.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear appropriate personal protective equipment (see Section 8).

Avoid breathing dust/vapor. Ensure adequate ventilation.

Evacuate personnel to safe areas. Keep people away from and upwind of spill.

6.2 Environmental precautions

Prevent product from entering drains, waterways, or soil.

Contain spill with inert absorbent material.

6.3 Methods and materials for containment and cleaning up

Sweep spilled substance into covered containers. Wash away remainder with plenty of water.

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SRP: The most favorable course of action is to use an alternative chemical product with less inherent propensity for occupational exposure or environmental contamination. Recycle any unused portion of the material for its approved use or return it to the manufacturer or supplier. Ultimate disposal of the chemical must consider: the material's impact on air quality; potential migration in soil or water; effects on animal, aquatic, and plant life; and conformance with environmental and public health regulations.

Aluminum compounds are treated under anhydrous conditions to prevent violent reactions, recover solvent, and form Al compounds suitable for landfill by reaction with anhydrous hydrolysis agent, eg calcium hydroxide.

/Aluminum compounds/

Recommendable methods: ...Peer-review: Small amounts of aluminum hydroxide can be discharged to sewer.

Neutralize to pH 6. Coagulant aid improves separation of Al(OH)₃ /aluminum hydroxide/. ...(Peer-review conclusions of an IRPTC expert consultation (May 1985))

SRP: Wastewater from contaminant suppression, cleaning of protective clothing/equipment, or contaminated sites should be contained and evaluated for subject chemical or decomposition product concentrations. Concentrations shall be lower than applicable environmental discharge or disposal criteria. Alternatively, pretreatment and/or discharge to a permitted wastewater treatment facility is acceptable only after review by the governing authority and assurance that "pass through" violations will not occur. Due consideration shall be given to remediation worker exposure (inhalation, dermal and ingestion) as well as fate during treatment, transfer and disposal. If it is not practicable to manage the chemical in this fashion, it must be evaluated in accordance with EPA 40 CFR Part 261, specifically Subpart B, in order to determine the appropriate local, state and federal requirements for disposal.

SRP: The scientific literature for the use of contact lenses in industry is conflicting. The benefit or detrimental effects of wearing contact lenses depend not only upon the substance, but also on factors including the form of the substance, characteristics and duration of the exposure, the uses of other eye protection equipment, and the hygiene of the lenses. However, there may be individual substances whose irritating or corrosive properties are such that the wearing of contact lenses would be harmful to the eye. In those specific cases, contact lenses should not be worn. In any event, the usual eye protection equipment should be worn even when contact lenses are in place.

Work clothing that becomes wet or significantly contaminated should be removed and replaced. /Aluminum (soluble salts and alkyls, as Al)/

Workers whose clothing may have become contaminated should change into uncontaminated clothing before leaving the work premises. /Aluminum (soluble salts and alkyls, as Al)/

The worker should immediately wash the skin when it becomes contaminated. /Aluminum (soluble salts and alkyls, as Al)/

For more Preventive Measures (Complete) data for ALUMINUM HYDROXIDE (7 total), please visit the HSDB record page.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Extremely reactive with air, moisture and compounds containing active hydrogen and therefore must be kept under a blanket of inert gas. /Aluminum alkyls/

In general, materials ... toxic as stored or which can decompose into toxic components ... Should be stored in cool ... ventilated place, out of ... sun, away from ... fire hazard ... be periodically inspected and monitored. Incompatible materials should be isolated ...

All possibility of contact with water must be avoided. Solution containing not more than 20% of these compounds in non-reactive solvents, however, can be handled without risk of spontaneous ignition. /Aluminum alkyls/

Must be stored in an inert atmosphere; sensitive to oxidation and hydrolysis in air. /Trialkylaluminums/

Separate from air, water, halocarbons, alcohols. Store in a cool, dry, well-ventilated location. Outside or detached storage is preferred. Inside storage should be in a standard flammable liquid storage warehouse, room, or cabinet. /Aluminum alkyls/

7.2 Conditions for safe storage, including any incompatibilities

Extremely reactive with air, moisture and compounds containing active hydrogen and therefore must be kept under a blanket of inert gas. /Aluminum alkyls/

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All possibility of contact with water must be avoided. Solution containing not more than 20% of these compounds in non-reactive solvents, however, can be handled without risk of spontaneous ignition. /Aluminum alkyls/

Must be stored in an inert atmosphere; sensitive to oxidation and hydrolysis in air. /Trialkylaluminums/

Separate from air, water, halocarbons, alcohols. Store in a cool, dry, well-ventilated location. Outside or detached storage is preferred. Inside storage should be in a standard flammable liquid storage warehouse, room, or cabinet.
/Aluminum alkyls/

Store away from incompatible materials (see Section 10).

[Note: Specific storage temperature not available in public databases. Refer to supplier Certificate of Analysis (COA) for exact storage conditions.]

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Exposure controls

8.1.1 Occupational exposure limits (OEL)

(inhalable fraction): 4 mg/m

8.1.2 Appropriate engineering controls

Use only in a chemical fume hood or with local exhaust ventilation.

Ensure adequate ventilation to keep airborne concentrations below exposure limits.

8.2 Individual protection measures

8.2.1 Eye/face protection

Wear chemical safety goggles.

8.2.2 Skin protection

Wear protective gloves. Recommended material: Nitrile rubber.

Wear suitable protective clothing (lab coat).

8.2.3 Respiratory protection

Use NIOSH-approved dust/mist respirator (N95 or higher) if ventilation is inadequate.

8.2.4 Thermal hazards

Not applicable.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance: White solid in various forms; [ICSC] White odorless granules; Slightly soluble in water; [MSDSonline]

b) Odor: No data available

c) Odor threshold: No data available

d) pH: No data available

e) Melting point/freezing point: 300 °C

f) Initial boiling point and boiling range: No data available

g) Flash point: No data available

h) Evaporation rate: No data available

i) Flammability (solid, gas): No data available

j) Upper/lower flammability or explosive limits: No data available

k) Vapor pressure: Vapor pressure, Pa at 20 °C:

l) Vapor density: No data available

m) Relative density: 2.42 g/cu cm

n) Water solubility: Insoluble in water; soluble in alkaline solutions, acid solutions

- o) Partition coefficient: n-octanol/water: Log P: No data available
- p) Auto-ignition temperature: No data available
- q) Decomposition temperature: No data available
- r) Viscosity: No data available
- s) Explosive properties: No data available
- t) Oxidizing properties: No data available

9.2 Other information

Topological Polar Surface Area (TPSA): 3 Å²

10. STABILITY AND REACTIVITY

10.1 Reactivity

No specific reactivity hazards identified under normal handling conditions.

10.2 Chemical stability

Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

No hazardous reactions under normal conditions.

10.4 Conditions to avoid

Avoid heat, sparks, open flames, direct sunlight, and moisture.

10.5 Incompatible materials

When coprecipitated with bismuth hydroxide and reduced by hydrogen, it is violently flammable.

Incompatible with chlorinated rubber.

Extremely reactive with air, moisture, and compounds containing active hydrogen... /Alkyl aluminum compounds/

Reacts violently with a broad range of materials including air & water. /Aluminum alkyls/

10.6 Hazardous decomposition products

No data available.

See also Section 5 (Fire-fighting measures) for combustion products.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity:

No acute toxicity data available.

Skin corrosion/irritation:

Causes skin irritation (H315).

Serious eye damage/eye irritation:

Causes serious eye irritation (H319).

Respiratory or skin sensitization:

No data available.

Germ cell mutagenicity:

No data available.

Carcinogenicity:

No data available.

Reproductive toxicity:

No data available.

Specific target organ toxicity (single exposure):

No data available.

Specific target organ toxicity (repeated exposure):

No data available.

Aspiration hazard:

No data available.

11.2 Additional information

Carcinogen classification:

Not listed by IARC. IARC classified aluminum production as carcinogenic to humans (Group 1), but did not implicate aluminum itself as a human carcinogen. (L135) A link between use of aluminum-containing antiperspirants and increased risk of breast cancer has been proposed (A235), but studies have not been able to establish a clear link (A15468).

Exposure routes:

The substance can be absorbed into the body by inhalation.

Oral (L739) ; inhalation (L739)

Signs and symptoms of exposure:

Inhalating aluminum dust causes coughing and abnormal chest X-rays. A small percentage of people are allergic to aluminium and experience contact dermatitis, digestive disorders, vomiting or other symptoms upon contact or ingestion of products containing aluminium. (L739, L740)

Data source: Hazardous Substances Data Bank (HSDB) via PubChem.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

/AQUATIC SPECIES/ Aluminum hydroxide toxicity was tested in fish. In a semistatic test using *Salmo trutta* (Brown trout), the NOEC was >100 mg/L/96 hr. In another study, aluminum hydroxide (99% purity) had no influence on *Leuciscus idus* (Orfe) for 48 hr under static conditions or *Daphnia magna* (Water flea) exposed for 24 hr. A NOEC of >100 mg/L/48 hr was found in a *Daphnia magna* acute immobilization test.

/AQUATIC SPECIES/ Algal assays are often carried out in culture media containing high concentrations of nutrients, including phosphate. These nutrients ameliorate the toxicity of aluminium, and limit the application of the results to natural waters. For example, in culture medium the green alga *Chlorella pyrenoidosa* successfully grew at concentrations of up to 12 mg total aluminium/L at pH 4.6, but an aluminium concentration of 24 mg/L was toxic. By selecting those algae which tolerated high levels of aluminium, the authors were able to develop algal cultures that grew at up to 48 mg/L. However, /another study/ found that maximum toxicity of aluminium to algal growth was achieved at pH 5.8 to 6.2, 5 ug labile Al/L significantly inhibiting the growth of the alga *Chlorella pyrenoidosa* in a synthetic hard water. The assay showed that toxicity is a function of the labile, rather than the total, aluminium. It was found that $Al(OH)_2^+$ was the aluminium species most toxic to the alga.

/AQUATIC SPECIES/ Sensitivities of bluegill (*Lepomis macrochins*), channel catfish (*Ictalurus puncta*

12.2 Persistence and degradability

No data available.

12.3 Bioaccumulative potential

No data available.

12.4 Mobility in soil

No data available.

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available.

12.6 Other adverse effects

No other adverse ecological effects identified.

13. DISPOSAL CONSIDERATIONS**13.1 Waste treatment methods**

Waste Treatment Methods: Waste material must be disposed of in accordance with national and local regulations. Leave chemicals in original containers and do not mix with other waste. Handle uncleaned containers in the same manner as the product itself.

14. TRANSPORT INFORMATION**14.1 UN number**

Not regulated as dangerous goods (research quantities typically exempt).

14.2 UN proper shipping name

Not subject to transport regulations (small quantities for research use).

14.3 Transport hazard class(es)

Not classified as dangerous goods for transport (research quantities).

14.4 Packing group

Not applicable (not regulated as dangerous goods in typical research quantities).

14.5 Environmental hazards

Marine pollutant: No (not classified as environmentally hazardous per GHS).

14.6 Special precautions for user

Transport in original packaging. Ensure containers are tightly sealed.

For bulk or commercial quantities, consult applicable transport regulations (DOT, IATA, IMDG).

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

Not applicable.

15. REGULATORY INFORMATION**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

US EPA / TSCA: Subject to EPA TSCA regulations

EU ECHA / REACH: Registered (REACH Active)

SARA 302 Components:

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

SARA 313 Components:

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards:

Acute (short-term) health hazard

Massachusetts Right To Know Components:

This material contains components subject to the Massachusetts Right to Know Act. See Section 2 for hazard classification.

Pennsylvania Right To Know Components:

This material contains components subject to the Pennsylvania Right to Know Act. See Section 2 for hazard classification.

New Jersey Right To Know Components:

This material contains components subject to the New Jersey Right to Know Act. See Section 2 for hazard classification.

California Prop. 65 Components:

This product does not contain any chemicals known to the State of California to cause cancer, birth defects, or any other reproductive harm.

Other regulatory listings:

- The Australian Inventory of Industrial Chemicals: Chemical: Aluminium hydroxide (Al(OH)₃)
- Federal Drinking Water Guidelines: EPA 50-200 ug/L /Aluminum/
- State Drinking Water Standards: (CA) CALIFORNIA 1000 ug/L /Aluminum/
- State Drinking Water Guidelines: (AZ) ARIZONA 73 ug/L /Aluminum/
(CA) CALIFORNIA 200 ug/L /Aluminum/
(ME) MAINE 1430 ug/L /Aluminum/
- FIFRA Requirements: Residues of aluminum hydroxide are exempted from the requirement of a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops or to raw agricultural commodities after harvest. Use: diluent, car

15.2 Chemical safety assessment

A chemical safety assessment has not been carried out for this substance.

For research-use-only compounds, no CSA is required under REACH Annex I.

16. OTHER INFORMATION

Revision Date: 2026/09/09

Further Information: The information provided is believed to be correct but is not exhaustive and should be used only as a guideline based on current knowledge. It does not represent a guarantee of the properties of the product. Selleck Chemicals Corporation and its Affiliates shall not be held liable for any damage resulting from handling or contact with the product.