# Material Safety Data Sheet

**Alum Powder** (RXSOL-19-1497-025)

## 1. Product and Company Identifaction

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|---|---|
| Product Name | Aluminium Sulphate (Alum Powder) |
| Synonyms | Aluminum sulfate; Aluminum sulphate; Aluminum (III) sulfate; Aluminum alum; Aluminum trisulfate; Cake alum; Dialuminum sulfate; Alum; Aluminum sesquisulfate |

Aluminum Sulfate, 14.3 Hydrate is the hydrated form. However, the CAS # 10043-01-3 is for the anhydrous form. Hydrated aluminum sulfate, A12(SO4)3*17H2O, is efflorescent and therefore may have approximately 14 molecules of water. The hydrate form may be indicated as “xH2O” and assigned CAS # 17927-65-0.

**Company Details:**

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## 2. Composition / informationon ingredients

| Chemical Name | CAS Number | EINECS number | RTECS number |
|---|---|---|---|
| Aluminum Sulfate | 10043-01-3 | 229-912-9 | BD 17 00000 |

## 3. Hazards Identification

**Emergency Overview :** Aluminum Sulfate is an odorless, lustrous white to grayish-white powder. This material can cause severe irritation and inflammation, or burns to the eyes. Contact with high concentration or prolonged contact may cause permanent damage. Inhalation of high airborne concentrations may cause constriction of the airways. Concentrated solutions are corrosive to the eyes, and gastrointestinal tract. When heated to decomposition, Aluminum Sulfate may emit toxic and corrosive fumes of sulfur dioxide and/or sulfur trioxide.

**Eyes :**Aluminum Sulfate can cause severe irritation and inflammation of the eyes. Concentrated solutions may cause permanent damage or blindness.

**Skin** : Aluminum Sulfate dusts can irritate the skin. Concentrated solutions are corrosive and may cause burns and permanent scarring. Prolonged exposure can cause numbing of the fingers. Prolonged contact can result in dermatitis (dry, red, itchy skin).

**Ingestion** : May cause burns to the mouth, throat and stomach. Symptoms may include vomiting, nausea, bleeding stomach, and abdominal pain. Ingestion of small amounts of aluminum sulfate may cause a sensation of dryness in the mucous membranes of the mouth and throat. Adverse effects on muscle and kidneys, and gum necrosis have been reported after ingestion of large amounts of aluminum compounds. Repeated ingestion over prolonged period can result in phosphate deficiency, which can cause softening and bending of bones. The approximate fatal dose in humans by ingestion is 30 grams.

**Inhalation** : Dusts of this Aluminum Sulfate form sulfuric acid when in contact with moisture in air or tissues. Inhalation of dust or mist is irritating to respiratory tract and mouth. Symptoms of irritation may include coughing, congestion and sore throat. Inhalation of high airborne concentrations may cause constriction of the airways and can result in potentially fatal pulmonary edema (accumulation of fluid in lungs).

## 4. First Aid Measures

**Contact With Skin :** Remove all contaminated clothing. For skin contact, wash thoroughly with soap and water for at least 20 minutes. Seek immediate medical attention if irritation develops or persists.

**Contact with eyes :** Immediately flush eyes with large amounts of room temperature water, occasionally lifting the lower and upper lids, for at least 15 minutes. If symptoms persist after 15 minutes of irrigation, seek medical attention.

**Ingestion :** DO NOT INDUCE VOMITING, unless directed by medical personnel. Have victim rinse mouth thoroughly with water, if conscious. Never give anything by mouth to a victim who is unconscious or having convulsions. Contact a physician or poison control center immediately.

**Inhalation :** Remove source of contamination or move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. Get immediate medical attention

## 5. Fire-fighting Measures

-Non combustible.

-Product will not ignite, but may burn. Caution: Sufficient heat may produce toxic gases. Product will decompose at its melting point [770°C (1418°F)]. In contact with water and metals, flammable hydrogen gas can be generated which can result in a fire hazard. Sealed containers can rupture violently in the heat of a fire-Not flammable. In case of fire use extinguishing media appropriate to surrounding conditions.

-When heated above 650-770°C (1200-1418°F) Aluminum Sulfate forms sulfur dioxide, sulfur trioxide, aluminum oxide and sulfuric acid.

**Extinguishing Media :** Dry chemical, foam, carbon dioxide. Do not use water; corrosive sulfuric acid will form.

**NFPA Ratings: Health: 2 Fire: 0 Instability: 1 Other:**

**Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe**

## 6. Accidental Release Measures

**Containment Procedures:** Stop the flow of material, if this can be done without risk. Contain the discharged material. If sweeping of a contaminated area is necessary use a dust suppressant agent, which does not react with product (see Section 10 for incompatibility information).

**Clean-Up Procedures:** Wear appropriate protective equipment and clothing during clean -up. Shovel the material into waste container. Thoroughly wash the area after a spill or leak clean-up. Solutions of the compound can be neutralized with lime or similar compound. Avoid contamination of soil, and prevent spill residue from running to groundwater or storm drains.

**Evacuation Procedures:** Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. Keep materials that burn away from spilled material. In case of large spills, follow all facility emergency response procedures.

**Special Procedures :** Remove soiled clothing and launder before reuse. Avoid all skin contact with the spilled material. Have emergency equipment readily available

## 7. Handling and Storage

Handling : All employees who handle this material should be trained to handle it safety. Do not breathe dust. Avoid all contact with skin and eyes. Use this product only with adequate ventilation. Wash thoroughly after handling.

**Storage Procedures :** Keep container tightly closed when not in use. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Material should be store in secondary containers or in a diked area, as appropriate. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). Use corrosion-resistant structural materials, lighting, and ventilation system in the storage area. Floors should be sealed to prevent absorption of this material. Have appropriate extinguishing equipment in the storage area (i.e., sprinkler system, portable fire extinguishers). Empty containers may contain residual particulates; therefore, empty containers should be handled with care. Do not cut, grind, weld or drill near this container. Never store food, feed, or drinking water in container that held this product. Keep this mateial away from food, drink and animal feed. Inspect all incoming containers before storage, to ensure container are properly labeled and not damaged. Do not store this material in open or unlabeled containers. limit quantity of material stored. Store in suitable containers that are corrosion-resitnt. Keep containers closed-material is hygroscopic.

## 8. Exposure controls and personal protection

**PERSONAL PROTECTIVE EQUIPMENT**

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (begining at 1910.132). Please reference applicable regulations and standards for relevant details.

**Eyes/Face :** Wear chemical safety goggles. If necessary, refer to U.S. OSHA 29 CFR 1910.133.

**Skin:** Where contact is likely, wear chemical resistant gloves, rubber boots, and coveralls. Buty rubber, natural rubber, polyethylene, polyvinyl chloride or neoprene gloves are recommanded. Gloves should be tested to determine suitability for prolonged contact with this material.

**Respiratory :** None required where adequate ventilation condition exist. If airborne concentrations are above the applicable exposure limits, use approved respiratory protection. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmosphere, use of a full-facepiece pressure/demand SCBA or full facepiece.

**General :** Wash hands thoroughly after handling material. Do not eat, drink or smoke in work areas. Have a safety shower or eye-wash fountain available. Use good hygiene practices when handling this material including changing and laundering work clothing after use. Discard contaminated shoes and leather goods.



Gloves



Suit

## 9. Physical and chemical properties

| | |
|---|---|
| Appearance | :Lustrous white to grayish-white |
| Odor | :Odorless |
| Physical State | :Powder |
| pH | :3.0-4.0 (5% aqueous solution at 25 deg C) |
| Vapor Pressure | :Essentially 0 mm Hg |
| Vapor Density | : Not applicable |
| Boiling Point | : > 1600 deg C (2912 deg F) |
| Freezing/Melting Point | : Decomp at 770 deg C (1418 deg F) |
| Solubility in Water | : 87.5 g/100mL at 20 deg C |
| Softening Point | : Not applicable |
| Evaporation Rate | : Not applicable |
| Viscosity | : Not applicable |
| Bulk Density | : 0.96 g/cc |
| Percent Volatile | : Not available |
| Chemical Formula | : Al2(SO4)3•17 H20 |

The data provided in this section are to be used for product safety handling purposes. Please refer to Product Certificates of Analysis for chemical and physical data for determinations of quality and for formulation purposes.

## 10. Stability and reactivity

**Stability:** Normally stable.When exposed to air, loss of combined water molecules by a hydrated material, such as this compound, will result in partial decomposition. Aluminum Sulfate is hydroscopic and will absorb moisture from the air. Avoid contact with moisture, excessive heat and incompatible materials listed below.

**Incompatibility :** Aluminum Sulfate is incompatible with strong oxidizing agents and strong bases (may react violently), moisture and most common metals in presence of moisture.

**Hazardous Decomposition :** Thermal decomposition: Sulfur dioxide, sulfur trioxide, and aluminum oxide. In contact with water: sulfuric acid.

**Hazardous Polymerization :** Will not occur.

## 11. Toxicological information

**Acute Toxicity :** Severely irritating or corrosive to the skin, eyes and gastrointestinal tract. Prolonged exposure to the skin may cause numbing effects. Product can cause severe irritation and inflammation of the eyes. Concentrated solutions may cause permanent damage to eyes .

LD50 ( Unreported-Rat) 410 mg/kg; LD50 (Oral-Mouse) 6207 mg/kg; LD50 (Intraperitoneal-Mouse) 274 mg/kg; LD50 (Unreported-Mouse) 520 mg/kg; LD50 (Unreported-Guinea Pig) 490 mg/kg

**Carcinogenicity :** Information not available.

**Carcinogenicity :** This compound is not listed by ACGIH, EPA, IARC, OSHA, NIOSH, or NTP.

**Neurotoxicity :** With extensive exposures, aluminum may accumulate in brain tissue producing neurotoxicity, including encephalopathy and seizures (based on animal data).

**Mutagenicity :** A solution of Aluminum Sulfate in water produced positive results in cultured human cells (leukolytes), via sister chromatid exchanges, micronuclei and chromosomal aberrations). Negative results have been obtained in bacteria and cultured mammalian cells.

**Other Toxicological Information :** On occasion workers chronically exposed to aluminum-containing dusts or fumes have developed severe pulmonary reactions including fibrosis, emphysema and pneumothorax. A much rarer encephalopathy has also been described. The factors which predispose to lung damage are not well characterized.

## 12. Ecological information

**Ecotoxicity :** Spills into water will result in hydrolysis to sulfuric acid solution with the capability of producing burns. TLm (mosquito fish) 48 hours = 240 ppm; Fatal (fundulus) 36 hours = 14 ppm (fresh water); LC50 (Largemouth bass) 96 hours = 250 ppm

**Environmental Fate**

**Bioconcentration:** No potential for food chain concentration. Aluminum sulfate will slowly be precipitated to Al(OH)3 due to natural alkalinity. A study was undertaken to assess the possibility of aluminum bioaccumulation (in rainbow trout). Trout tissues, plankton, and water were analyzed for total aluminum concentration. Statistical comparisons of experimental and control tissues revealed few overall significant differences in the level of aluminum between alum-exposed and non-exposed fish, but significant differences existed between tissues within a given treatment and age class

## 13. Disposal considerations

As shipped, product is not considered a hazardous waste by the EPA. However, product should be tested for corrosivity to determine if Waste Number D002 applies. No EPA Waste Numbers are applicable for this compound.

**Disposal Instructions :** Review federal, provincial, and local government requirements prior to disposal. Disposal by controlled incineration or secure landfill may be acceptable.

## 14. Transport information

NOTE:
**Shipping Name:** Non-regulated

**Hazard Class:** Not Applicable

**Packing Group:** Not Applicable Required Label(s): None

**Name:** Environmentally hazardous substance, solid, n.o.s. (aluminum sulfate)

**Passenger & Cargo Aircraft Packing Instruction: 911 Passenger & Cargo Aircraft Maximum Net Quantity: 400 kg**

**International Maritime Organization (I.M.O.) Classification :** Aluminum Sulfate is not regulated under I.M.O.

- Not classified as hazardous for transport

## 15. Regulatory information

**RISK PHRASES :** R-41 Risk of serious damage to eyes.
**SAFETY PHR ASES:** S-39 Wear eye/face protection.
S-26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
**UK R EGULA TORY REFEREN CES:** The Control of Substances Hazardous to Health Regulations 1988. Chemicals (Hazard Information & Packaging) Regulations 1993. Classification, Packaging and Labelling Regulations 1984.

**CO MMENTS:** This material does not require classification, however in view of its potential to cause ocular damage it has been classified as Xi in accordance with suppliers data/information.

## 16. Other information

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