School Material Safety Data Sheet

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ALUMINUM SULFATE
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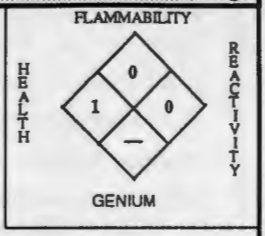
SECTION 1. INTRODUCTORY INFORMATION 3



MATERIAL NAME AND FORMULA: ALUMINUM SULFATE; $Al_2(SO_4)_3 \cdot 18H_2O$

SYNONYMS: Alum;* Sulfuric Acid, Aluminum Salt; Cake Alum; Pearl Alum; Pickle Alum; Filter Alum; Paper Maker's Alum; Patent Alum; Aluminum Alum. Alunogenite is the naturally occurring mineral form.

* Alum is the name often applied to any of three compounds: aluminum ammonium sulfate (ammonium alum), aluminum potassium sulfate (potash alum), and aluminum sulfate (synonyms above).

CAS NUMBER: 10043-01-3

TYPICAL COMPOSITION: Aluminum Sulfate; >99% (Water of hydration varies from 0% to 49.6% [liquid form])

DOT CLASSIFICATION: ORM-B I.D. No. NA 1760

EPA CLASSIFICATION: CERCLA Hazardous Substance (40 CFR 302)

MANUFACTURER'S INFORMATION: Always request material safety data sheets from your chemical supplier. These should indicate the manufacturer's emergency telephone number. See the Resources/Manufacturers Index for some of the larger manufacturers and available telephone numbers.

DESCRIPTION: White lustrous crystals, granules, or powder with no odor. Reported to have a sweet taste - Do Not Ingest! $Al_2(SO_4)_3 \cdot 49.6H_2O$ is a clear liquid with a green or brown tint.

OVERVIEW: This material has a variety of chemistry lab applications. Aluminum sulfate is also used for fireproofing and waterproofing cloth, as a precipitating agent in water and sewage treatment, as a foaming agent in fire foams, and as a food additive. Although an irritant to body tissue and acidic in nature, it is not combustible and presents few hazards if used with care and reasonable precautions are taken.

SECTION 2. USE AND STORAGE INFORMATION

— PRELIMINARY PLANNING CONSIDERATIONS —

- *PROVIDE FOR SAFE DISPOSAL OF ALL CHEMICAL WASTE* generated in the school. Check applicable regulations prior to use.
- *Wear safety glasses or goggles* and appropriate protective clothing when working with this substance.
- Employees and students should know the location of eyewash and shower facilities in the vicinity of the area where this material is used. Be sure that eyewash stations and safety showers are kept in good working order at all times.
- Provide adequate ventilation to avoid exceeding the TLV (Sec. 4).
- Rubber gloves are recommended to minimize skin contact when working with this material, especially where open wounds, cuts or abrasions are present.

— USAGE PRECAUTIONS AND PROCEDURES —

- READ THE LABEL and follow all precautions.
- Practice good housekeeping to avoid unintentional mixing of incompatible materials. Do not allow residues or dust to build up in the lab or work area.
- For safety, *DO NOT WEAR CONTACT LENSES WHEN WORKING WITH CHEMICALS AND CHEMICAL PRODUCTS*; soft lenses may absorb irritants, and all lenses may concentrate them. Particles can also adhere to contact lens surfaces and cause corneal damage.
- After working with this material, always wash hands and face before eating, drinking, or smoking.
- Do not smoke in storage or use area.
- Avoid creating airborne dust conditions. Wearing a dust mask may be advisable in certain instances.
- Remove and launder contaminated clothing before wearing again.
- Keep this material away from notebooks, textbooks, and personal belongings to avoid contamination and the transport of chemical residues out of the lab/work area.
- Do not let aluminum sulfate come into contact with eyes, skin, or clothing. Avoid inhaling the dust or solution mist from this chemical. Do not taste or swallow this substance.
- Clean up spilled material promptly and thoroughly.

— ADDITIONAL INFORMATION —

- Aluminum sulfate does not polymerize. It is stable at room temperature under normal handling and storage conditions.
- Aluminum sulfate solutions or liquid are acidic in nature; making them corrosive to ferrous metals and mild steel.

— PREFERRED STORAGE LOCATION AND METHODS —

- Storage area should be cool and well ventilated. Containers should be tightly closed.
- Do not store chemicals alphabetically by name; store them by chemical family instead, to keep compatibles together.
- Protect all chemical containers from physical damage and keep them out of direct sunlight.
- Do not permit smoking in areas where chemicals are stored.
- Purchase only amounts equivalent to one year's needs.
- Store with compatible materials on sturdy shelving.

SECTION 3. SPILLS AND DISPOSAL PROCEDURES

IF MATERIAL IS SPILLED:

- Ventilate area of spill.
- Clean up spilled material promptly and thoroughly.
- Cleanup personnel should wear personal protective equipment to prevent skin or eye contact and inhalation of liquid or mist.
- Liquid alum, $Al_2(SO_4)_3 \cdot 49.6H_2O$ can cause extremely slippery footing when spilled on floors.
- Cover liquid spills with limestone, hydrated or slaked lime, or soda ash to neutralize; then pick it up for disposal. Dike the spill area with an inert absorbent material, as needed, to contain the spilled material.
- Sweep, vacuum, or scoop spilled solid, avoiding generation of dust. Place it in a suitable container (with a secure lid) for later disposal.
- Cleanup methods such as vacuuming (with an appropriate filter) or wet mopping minimize dispersion of dust.

DISPOSAL OF SMALL QUANTITIES:

NOTE: Emptied containers could contain chemical residues; handle with care.

- Consider recycling, reclamation, or destruction to a less hazardous material rather than disposal of untreated waste to a landfill. Follow all applicable regulations for disposal of aluminum sulfate or its by-products. (Treatment with neutralizing material as noted above should be carried out before disposal.)

DISPOSAL OF LARGER AMOUNTS: Contact your supplier or a licensed disposal company.

•• FOLLOW ALL APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS FOR ALL WASTE DISPOSAL ••

SECTION 4. HEALTH HAZARDS

- Aluminum sulfate has not been identified as a known or suspected carcinogen by the NTP, IARC, or OSHA.

Current OSHA TWA: 2 $\mu g/m^3$

Current ACGIH TLV: 8-hr TWA: 2 mg/m^3 (for soluble salts of aluminum)

- **Toxicity Data:**
  Mouse, Intraperitoneal, LD_{50}: 270 mg/kg
  Mouse, Oral, LD_{50}: 6.2mg/kg
- Aluminum sulfate is an acidic salt that can irritate the eyes, skin, open wounds, and mucous membranes.
- Chronic overexposure of the skin to this substance can cause contact dermatitis as well as an anaesthetic effect on fingers.
- Inhalation of solution mists can be irritating to the respiratory tract and lungs, but these symptoms are transient.
- Long-term exposure to the dust can cause some individuals to experience nighttime wheezing and breathlessness. Ingestion of small amounts may cause dryness of the mucous membranes of the mouth and throat and puckering of the lips. Ingestion of solutions of >20% is reported to cause seizures.
- Ingestion of large doses can produce stomach irritation, nausea, and vomiting.
- Aluminum sulfate is used as a food additive and appears on the GRAS (Generally Recognized As Safe) list of food additives approved by the FDA.

SECTION 5. FIRST AID PROCEDURES

Eye contact:
- Flush eyes promptly, including under the eyelids, with plenty of running water. Continue for at least 15 minutes.
- Get medical attention.*

Skin contact:
- Remove contaminated clothing promptly.
- Flush affected area with large amounts of water. Wash exposed areas of skin with soap and water.
- Get medical attention if irritation occurs.*

Inhalation:
- Remove victim to fresh air; restore/support his breathing as necessary.
- Get medical help if victim is breathing with difficulty or coughing.*

Ingestion:
- Thoroughly rinse victim's mouth with water.
- Give victim several glasses of water to drink to dilute the material. Do not induce vomiting unless instructed by a physician to do so.
- Never give anything by mouth to someone who is unconscious or convulsing.
- Contact medical personnel.*

* *Get medical help* (in school, paramedic, or community) *for further treatment, observation, and support after first aid.*

SECTION 6. FIRE PROCEDURES AND DATA

- Aluminum sulfate is noncombustible. It is sometimes used as a flame retardant and in the preparation of fire foams.
- This material in liquid form may cause flooring to become very slippery.
- Extinguishing media: Use media appropriate to surrounding fire conditions.
- For major fires, fire fighters should wear appropriate protective clothing and use respiratory protection. Self-contained breathing apparatus is recommended.
- A water spray may be used to cool fire-exposed containers and disperse vapors.

HAZARDOUS DECOMPOSITION PRODUCTS INCLUDE: Oxides of sulfur: Produced at temperatures greater than 1418°F (770°C).

FLASH POINT: Not Applicable

AUTOIGNITION TEMPERATURE: Not Found

FLAMMABILITY LIMITS IN AIR (Vol %): Not Applicable

SECTION 7. PHYSICAL DATA

BOILING POINT (@ 1 atm): Not Applicable (decomposes)
SOLUBILITY IN WATER (@ 20°C): Complete *
pH OF AQUEOUS SOLUTION: 1 to 3.5
SPECIFIC GRAVITY [$Al_2(SO_4)_3$]: 2.71
SPECIFIC GRAVITY [$Al_2(SO_4)_3 \cdot 18H_2O$]: 1.62

* Nearly insoluble in alcohol

MELTING POINT [$Al_2(SO_4)_3$]: Decomposes @ 1418°F (770°C)
MELTING POINT [$Al_2(SO_4)_3 \cdot 18H_2O$]: Decomposes @ 187.7°F (85.6°C)
MOLECULAR WEIGHT: 342.14 [666.42 for $Al_2(SO_4)_3 \cdot 18H_2O$]
% VOLATILE: Not Found

REFERENCES: **Genium's Industrial MSDS 92 (2/87) and references 1, 2, 4-7, 10, 34, 47, 63, 81, 82, 82, 502, 506, 511, 521, 522.**
(see glossary for titles)

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