Material Safety Data Sheet - MSDS

Dry Alum

Section 1. Chemical Product and Company Identification

Trade name : Dry Alum

Material uses : Alum is used as a coagulating agent in municipal and industrial water and wastewater treatment and as an additive in papermaking.

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Validation date : **11/15/2007**

In case of emergency : Canada : CANUTEC 1-613-996-6666
US : CHEMTREC: 1-800-424-9300

Section 2. Hazards identification

Physical state and Appearance : Solid. (Granules or powder.)

This material is classified hazardous under OSHA regulations in the United States and the WHMIS Controlled Product Regulation in Canada.

Emergency overview : WARNING!
CAUSES EYE AND SKIN IRRITATION.
MAY CAUSE ALLERGIC SKIN REACTION.
Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

Routes of entry : Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

Eyes : The dust becomes acidic following contact with moisture in the eye and may result in moderate to severe irritation to eyes.

Skin : The dust becomes acidic following contact with moisture on the skin and mild to moderate irritation can occur. Aluminum is very poorly absorbed through the skin and toxic effects would not be expected following short-term skin contact. Prolonged and repeated exposure to dilute solutions may cause irritation, redness, pain and drying and cracking of the skin.

Inhalation : Dusts of aluminum sulfate hydrate probably cause irritation of the nose, throat and respiratory tract based on pH. The dust becomes acidic following contact with moisture in the air or tissues of the respiratory tract.

Ingestion : May cause irritation of the lining of the stomach. Ingestion is not a typical route of occupational exposure.

Potential chronic health effects : CARCINOGENIC EFFECTS: Not classified or listed by IARC, NTP, OSHA, EU and ACGIH.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.

Medical conditions aggravated by over-exposure : Skin irritation may be aggravated in individuals with existing skin lesions. Breathing of dust may aggravate acute or chronic asthma and chronic pulmonary disease such as emphysema and bronchitis.

Over-exposure signs/symptoms : Prolonged or repeated contact with dust may cause redness, dryness and itching of the skin (dermatitis).

See Section 11 for Toxicological Data.

Continued on next page

Section 3. Composition/information on ingredients

Name	CAS #	% by weight
Aluminum Sulfate Hydrate	16828-12-9	99

See Section 8 for Exposure Limits.
See Section 11 for Toxicological Data.

Section 4. First Aid Measures

Eye contact : Immediately flush eyes with lukewarm, gently running water for a minimum of 5 minutes or until the chemical is removed. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.

Skin contact : Flush skin with lukewarm running water for a minimum of 5 minutes or until the chemical is removed. Start flushing while removing contaminated clothing. If irritation persists, repeat flushing and obtain medical attention. Do not transport victim unless the recommended flushing period is completed or flushing can be continued during transport.
Discard heavily contaminated clothing and shoes in a manner, which limits further exposure. Otherwise, wash clothing separately before reuse.

Inhalation : Move victim to fresh air. If irritation persists, obtain medical attention immediately. Give artificial respiration ONLY if breathing has stopped. Give Cardiopulmonary Resuscitation (CPR) if there is no breathing AND no pulse. Obtain medical attention IMMEDIATELY.

Ingestion : If irritation or discomfort occur, obtain medical advice immediately.

Notes to physician : Not available.

Section 5. Fire Fighting Measures

Flammability of the product : Non-flammable.

Auto-ignition temperature : Not applicable.

Flash points : Not applicable.

Flammable limits : Not applicable.

Products of combustion : Forms aluminum oxide, sulfur dioxide and/or sulfur trioxide at temperatures reported above 650 ˚C (1200˚F).

Fire hazards in the presence of various substances : Not applicable.

Explosion hazards in the presence of various substances : Dry alum will dissolve in water to form sulfuric acid which reacts with some metals, especially when dilute, to give flammable, potentially explosive hydrogen gas. Hydrogen gas can accumulate to explosive concentrations inside confined spaces. Follow appropriate NFPA codes.

Fire-fighting media and instructions : Use appropriate extinguisher for surrounding material.

Protective clothing (fire) : The decomposition products are corrosive and hazardous to health. Wear a NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if vapors or mists are present. For fighting fires in close proximity to spill or vapors, use acid-resistant personal protective equipment. Evacuate residents who are downwind of fire. Prevent unauthorized entry to fire area. Dike area to contain runoff and prevent contamination of water sources. Neutralize runoff with lime, soda ash or other suitable neutralizing agents (see Deactivating Chemicals, Section 6). Cool containers that are exposed to flame with streams of water until fire is out. Take care not to get water inside container.

Section 6. Accidental Release Measures

Small spill and leak : Shovel into clean, dry, labelled containers and cover. Flush area with water. Do not get water inside containers or on spilled material.

Large spill and leak : Prevent solids from mixing with water or entering sewers or waterways. Shovel into clean, dry, labelled containers and cover. If liquid is present, dike with inert material (sand, earth, etc.). Consider in situ neutralization and disposal. Ensure adequate decontamination of tools and equipment following clean up. Comply with Federal, Provincial/State and local regulations on reporting releases.
Deactivating Chemicals: Lime, limestone, soda ash, sodium bicarbonate, dilute sodium hydroxide, dilute aqua ammonia.

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Section 7. Handling and Storage

Handling : Dry Alum is an irritating solid. Avoid generating dusts. Do not breathe dusts. Do not ingest. Do not get in eyes, on skin or on clothing. Use proper tools when opening containers. Keep containers closed when not in use. Empty containers may contain hazardous residues. When there is a large-scale use, do not use in areas equipped with sprinkler systems. Post "DO NOT USE WATER" signs. Good housekeeping is important to prevent accumulations of dust. Dry sweeping is not recommended.

Storage : Keep container tightly closed. Keep container in a cool, dry, well-ventilated area. Store away from incompatible materials such as strong bases. Post warning signs.

Section 8. Exposure Controls, Personal Protection

Engineering controls : Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. If user operations generate dust, fumes or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.The most effective measures are the total enclosure of processes and the mechanization of handling procedures to prevent all personal contact. Use a corrosion resistant ventilation system separate from other exhaust ventilation systems.

Personal protection

Eyes : Splash goggles.

Body : Lab coat or coveralls.

Respiratory : NIOSH/MSHA approved dust mask, for dust concentrations of up to 10 mg/m^3. Air-purifying respirator equipped with acid gas/fume, dust, mist cartridges for concentrations up to 20 mg/m^3. An air-supplied respirator if concentrations are higher or unknown.

Hands : Gloves: Neoprene, PVC, vinyl or rubber.

Feet : Appropriate industrial footware.

Protective clothing (pictograms) :

Personal protection in case of a large spill : Splash goggles. Full suit. Dust respirator. Boots. Gloves. Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product. Suggested protective clothing might not be adequate. Consult a specialist before handling this product.

Exposure limits

Product name	Exposure limits
Aluminum Sulfate Hydrate	**ACGIH TLV (United States).** TWA: 2 mg/m³ 8 hour(s). Form: as Aluminium (soluble salts) **OSHA PEL (United States).** TWA: 2 mg/m³ 8 hour(s). Form: as Aluminium (soluble salts)

Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

Physical state and Appearance : Solid. (Granules or powder.)

Color : White.

Odor : Odorless.

Molecular weight : 594.4 g/mole

Molecular formula : $Al_2(SO_4)_3.14\ H_2O$

pH : > 2.9 @ 5%.

Boiling/condensation point : Not available.

Melting/freezing point : 86°C (186.8°F)

Specific gravity : Not available.

Vapor pressure : Not available.

Vapor density : Not available.

Odor threshold : Not available.

Evaporation rate : Not available.

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$LogK_{ow}$: Not available.
Solubility : Solubility in water at 20°C equivalent to approximately 8 wt-% Al_2O_3.

Section 10. Stability and Reactivity

Stability and reactivity : The product is stable.

Incompatibility with various substances : Strong bases such as sodium hydroxide. Reaction may be violent.

Hazardous decomposition products : Sulfuric acid vapors may be released upon heating and sulfur dioxide and sulfur trioxide may be released upon decomposition.

Hazardous polymerization : Will not occur.

Section 11. Toxicological Information

Toxicity data

Ingredient name	Test	Result	Route	Species
Aluminum Sulfate Hydrate	LD50	>9000 mg/kg	Oral	Rat
	LD50	>9000 mg/kg	Oral	Mouse

Chronic effects on humans : See Section 2.

Other toxic effects on humans : Very hazardous by the following route of exposure: of eye contact (irritant).
Hazardous by the following route of exposure: of skin contact (irritant).
Slightly hazardous by the following route of exposure: of inhalation (lung irritant).

Section 12. Ecological Information

Ecotoxicity data

Ingredient name	Species	Period	Result
Aluminum Sulfate Hydrate	Goldfish (LC50)	72 hour(s)	100 mg/l

Products of degradation : Decomposition products may include the following materials: carbon and sulfur oxides (CO_2, CO, SO_3 & SO_4). Toxicity is primarily associated with acidic pH. Acidic soil conditions can develop with the material present leading to release of some trace metals.

Toxicity of the products of biodegradation : The products of biodegradation are more toxic than the original product.

Section 13. Disposal Considerations

Waste information : Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Consult your local or regional authorities.

Section 14. Transport Information

Canada (TDG) : Not regulated.

United States (DOT) : RQ, UN3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCES, SOLID, N.O.S. (Aluminum sulfate), 9, PG III.

ERG : 171

Section 15. Regulatory Information

WHMIS (Canada) : Class D-2B: Material causing other toxic effects (Toxic).

Canada inventory: All components are listed or exempted.

CEPA Toxic substances: This material is not listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is not listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

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This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

HCS Classification : Irritating material

U.S. Federal Regulations : **United States inventory (TSCA 8b):** All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: No products were found.
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.

State Regulations :

Connecticut Carcinogen Reporting: This material is not listed.
Connecticut Hazardous Material Survey: This material is not listed.
Florida substances: This material is not listed.
Illinois Chemical Safety Act: This material is not listed.
Illinois Toxic Substances Disclosure to Employee Act: This material is not listed.
Louisiana Reporting: This material is not listed.
Louisiana Spill: This material is not listed.
Massachusetts Spill: This material is not listed.
Massachusetts Substances: This material is not listed.
Michigan Critical Material: This material is not listed.
Minnesota Hazardous Substances: This material is not listed.
New Jersey Hazardous Substances: This material is not listed.
New Jersey Spill: This material is not listed.
New Jersey Toxic Catastrophe Prevention Act: This material is not listed.
New York Acutely Hazardous Substances: This material is not listed.
New York Toxic Chemical Release Reporting: This material is not listed.
Pennsylvania RTK Hazardous Substances: This material is not listed.
Rhode Island Hazardous Substances: This material is not listed.

California Prop. 65

No products were found.

Section 16. Other Information

Hazardous Material Information System (U.S.A.)

Health	2
Fire hazard	0
Physical Hazard	0
Personal protection	E

National Fire Protection Association (U.S.A.)

References : - 29CFR Part1910.1200 OSHA MSDS Requirements. - 49CFR Table List of Hazardous Materials, UN#, Proper Shipping Names, PG. ANSI Z400.1, MSDS Standard, 2004. - Canada Gazette Part II, Vol. 122, No. 2. Registration SOR/88-64, 31 December 1987. Hazardous Products Act "Ingredient Disclosure List" - Canadian Transport of Dangerous Goods, Regulations and Schedules, Clear Language version 2005. - Manufacturer's Material Safety Data Sheet.

Responsible name : **Atrion Regulatory Services, Inc.**
Date of issue : **11/15/2007**
Date of previous issue : **09/30/2006**
Version : **3**

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