

ALUMINUM SULFATE

ALM

CAUTIONARY RESPONSE INFORMATION

Common Synonyms	Solid	Gray-white	Odorless
Alum Cake aluminum Paper maker's alum Patent aluminum	Sinks and mixes slowly with water.		
<p>AVOID CONTACT WITH LIQUID AND VAPOR, KEEP PEOPLE AWAY. Wear goggles, self-contained breathing apparatus, and rubber overclothing (including gloves). Stop discharge if possible. Isolate and remove discharged material. Notify local health and pollution control agencies.</p>			
Fire	Not flammable. Wear goggles, self-contained breathing apparatus and rubber overclothing (including gloves). Extinguish with dry chemicals or carbon dioxide. DO NOT USE WATER ON FIRE.		
Exposure	CALL FOR MEDICAL AID. DUST Irritating to eyes, nose and throat. If inhaled will cause difficult breathing. If in eyes, hold eyelids open and flush with plenty of water. If breathing has stopped, give artificial respiration. If breathing is difficult, give oxygen. SOLID Irritating to skin and eyes. If swallowed will cause nausea or vomiting. Remove contaminated clothing and shoes. Flush affected areas with plenty of water. IF IN EYES, hold eyelids open and flush with plenty of water. IF SWALLOWED and victim is CONSCIOUS, have victim drink water or milk. IF SWALLOWED and victim is UNCONSCIOUS OR HAVING CONVULSIONS, do nothing except keep victim warm.		
Water Pollution	HARMFUL TO AQUATIC LIFE IN VERY LOW CONCENTRATIONS. May be dangerous if it enters water intake. Notify local health and wildlife officials. Notify operators of nearby water intakes.		

1. CORRECTIVE RESPONSE ACTIONS

Stop discharge

2. CHEMICAL DESIGNATIONS

- 2.1 CG Compatibility Group: Not listed
- 2.2 Formula: $Al_2(SO_4)_3 \cdot 18H_2O$
- 2.3 IMO/UN Designation: Not listed
- 2.4 DOT ID No.: Not listed
- 2.5 CAS Registry No.: 10043-01-3
- 2.6 NAERG Guide No.: 171
- 2.7 Standard Industrial Trade Classification: 52329

3. HEALTH HAZARDS

- 3.1 Personal Protective Equipment: Dust respirator; goggles or face shield; rubber gloves
- 3.2 Symptoms Following Exposure: Inhalation of dust irritates nose and mouth. Ingestion of large doses causes gastric irritation, nausea, vomiting, and purging. Dust irritates eyes and skin.
- 3.3 Treatment of Exposure: INHALATION: rinse nose and mouth with water. INGESTION: give large amounts of water. EYES: flush with water for at least 15 min. SKIN: flush with water, wash with soap and water.
- 3.4 TLV-TWA: Not listed.
- 3.5 TLV-STEL: Not listed.
- 3.6 TLV-Ceiling: Not listed.
- 3.7 Toxicity by Ingestion: Grade 2; oral mouse $LD_{50} = 770$ mg/kg
- 3.8 Toxicity by Inhalation: Currently not available.
- 3.9 Chronic Toxicity: Currently not available
- 3.10 Vapor (Gas) Irritant Characteristics: Currently not available
- 3.11 Liquid or Solid Characteristics: Currently not available
- 3.12 Odor Threshold: Currently not available
- 3.13 IDLH Value: Not listed.
- 3.14 OSHA PEL-TWA: Not listed.
- 3.15 OSHA PEL-STEL: Not listed.
- 3.16 OSHA PEL-Ceiling: Not listed.
- 3.17 EPA AEGL: Not listed

4. FIRE HAZARDS

- 4.1 Flash Point: Not flammable
- 4.2 Flammable Limits in Air: Not flammable
- 4.3 Fire Extinguishing Agents: Not pertinent
- 4.4 Fire Extinguishing Agents Not to Be Used: Water
- 4.5 Special Hazards of Combustion Products: Not pertinent
- 4.6 Behavior in Fire: Currently not available
- 4.7 Auto Ignition Temperature: Not pertinent
- 4.8 Electrical Hazards: Not pertinent
- 4.9 Burning Rate: Not pertinent
- 4.10 Adiabatic Flame Temperature: Not pertinent
- 4.11 Stoichiometric Air to Fuel Ratio: Not pertinent
- 4.12 Flame Temperature: Not pertinent
- 4.13 Combustion Molar Ratio (Reactant to Product): Currently not available
- 4.14 Minimum Oxygen Concentration for Combustion (MOCC): Not listed

5. CHEMICAL REACTIVITY

- 5.1 Reactivity with Water: No reaction
- 5.2 Reactivity with Common Materials: May corrode metals in presence of moisture
- 5.3 Stability During Transport: Stable
- 5.4 Neutralizing Agents for Acids and Caustics: Flush with water.
- 5.5 Polymerization: Not pertinent
- 5.6 Inhibitor of Polymerization: Not pertinent

6. WATER POLLUTION

- 6.1 Aquatic Toxicity: 14ppm/36 hr/fundulus/fatal/fresh water 240ppm/48 hr/mosquitofish/TL_m/*Water type not specified.
- 6.2 Waterfowl Toxicity: Currently not available
- 6.3 Biological Oxygen Demand (BOD): None
- 6.4 Food Chain Concentration Potential: None
- 6.5 GESAMP Hazard Profile: Not listed

7. SHIPPING INFORMATION

- 7.1 Grades of Purity: Technical
- 7.2 Storage Temperature: Ambient
- 7.3 Inert Atmosphere: No requirement
- 7.4 Venting: Open
- 7.5 IMO Pollution Category: Currently not available
- 7.6 Ship Type: Currently not available
- 7.7 Barge Hull Type: Currently not available

8. HAZARD CLASSIFICATIONS

- 8.1 49 CFR Category: Not listed
- 8.2 49 CFR Class: Not pertinent
- 8.3 49 CFR Package Group: Not listed.
- 8.4 Marine Pollutant: No
- 8.5 NFPA Hazard Classification: Not listed
- 8.6 EPA Reportable Quantity: 5000
- 8.7 EPA Pollution Category: D
- 8.8 RCRA Waste Number: Not listed
- 8.9 EPA FWPCA List: Yes

9. PHYSICAL & CHEMICAL PROPERTIES

- 9.1 Physical State at 15° C and 1 atm: Solid
- 9.2 Molecular Weight: 666.4
- 9.3 Boiling Point at 1 atm: Not pertinent
- 9.4 Freezing Point: Not pertinent
- 9.5 Critical Temperature: Not pertinent
- 9.6 Critical Pressure: Not pertinent
- 9.7 Specific Gravity: 1.7 at 20°C (solid)
- 9.8 Liquid Surface Tension: Not pertinent
- 9.9 Liquid Water Interfacial Tension: Not pertinent
- 9.10 Vapor (Gas) Specific Gravity: Not pertinent
- 9.11 Ratio of Specific Heats of Vapor (Gas): Not pertinent
- 9.12 Latent Heat of Vaporization: Not pertinent
- 9.13 Heat of Combustion: Not pertinent
- 9.14 Heat of Decomposition: Not pertinent
- 9.15 Heat of Solution: -22.1 Btu/lb = -12.3 cal/g = 0.515 X 10³ J/kg
- 9.16 Heat of Polymerization: Not pertinent
- 9.17 Heat of Fusion: Currently not available
- 9.18 Limiting Value: Currently not available
- 9.19 Reid Vapor Pressure: Currently not available

NOTES

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9.20 SATURATED LIQUID DENSITY		9.21 LIQUID HEAT CAPACITY		9.22 LIQUID THERMAL CONDUCTIVITY		9.23 LIQUID VISCOSITY	
Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F	Temperature (degrees F)	British thermal unit inch per hour-square foot-F	Temperature (degrees F)	Centipoise
	N O T P E R T I N E N T		N O T P E R T I N E N T		N O T P E R T I N E N T		N O T P E R T I N E N T

9.24 SOLUBILITY IN WATER		9.25 SATURATED VAPOR PRESSURE		9.26 SATURATED VAPOR DENSITY		9.27 IDEAL GAS HEAT CAPACITY	
Temperature (degrees F)	Pounds per 100 pounds of water	Temperature (degrees F)	Pounds per square inch	Temperature (degrees F)	Pounds per cubic foot	Temperature (degrees F)	British thermal unit per pound-F
34	37.730		N O T		N O T		N O T
36	37.770		P E R T I N E N T		P E R T I N E N T		P E R T I N E N T
38	37.800						
40	37.830						
42	37.870						
44	37.900						
46	37.930						
48	37.970						
50	38.000						
52	38.030						
54	38.070						
56	38.100						
58	38.130						
60	38.170						
62	38.200						
64	38.230						
66	38.270						
68	38.300						
70	38.330						
72	38.370						
74	38.400						
76	38.430						
78	38.470						
80	38.500						
82	38.530						
84	38.570						