



◆ SECTION 1 INTRODUCTION

Material Calcium Sulfate, ca 100%

Chemical Formula CaSO_4

CAS Number 7778-18-9

Synonyms. Gypsum, mineral white, alabaster, plaster of Paris, satin spar, terra alba, selenite

DOT Classification Not listed as a Hazardous Material for Transportation (49 CFR 172.101)

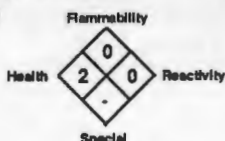
EPA Classification Not listed as a RCRA Hazardous Waste (40 CFR 261.33), a CERCLA Hazardous Substance (40 CFR 302.4), a SARA Extremely Hazardous Substance (40 CFR 355), or a SARA Toxic Chemical (40 CFR 372.65)

OSHA Classification Not listed as an Air Contaminant (29 CFR 1910.1000, Subpart Z/Table Z-1-A)

NFPA Hazard Rating Not found

Genium Hazard Rating

4 = Extreme
3 = High
2 = Moderate
1 = Slight
0 = Minimum



Description White powder or crystals; odorless. The mineral anhydrite is the natural form of anhydrous calcium sulfate which occurs as insoluble anhydrite, dihydrate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$, gypsum), and hemihydrate ($\text{CaSO}_4 \cdot 1/2\text{H}_2\text{O}$, plaster of Paris). The insoluble anhydrite is obtained upon complete dehydration of gypsum above 1202 °F (650 °C). Soluble anhydrite is obtained from complete dehydration of gypsum in an electric oven below 572 °F (300 °C). Gypsum can be converted to the hemihydrate using modest amounts of controlled heat.

Overview Calcium sulfate is used in sculpture, sand casting, and many other art projects. It may also be used as a desiccant (Drierite®) in laboratories. Use with care and reasonable precautions. Avoid dust inhalation. Adequate ventilation is essential. The insoluble anhydrite is used as a paper filler and cement component. With its strong tendency to absorb moisture, soluble anhydrite is used as a drying agent for solids, organic liquids, and gases; and as a laboratory desiccant (Drierite®). The hemihydrate is used for wall plasters, tiles, wallboard, moldings, statuary, blocks for building industry; and in the paper industry. The dihydrate is used in manufacturing portland cement, plaster of Paris, artificial marble, sulfuric acid, porous polymers, calcium carbide (CaC_2), and ammonium sulfate $[(\text{NH}_4)_2\text{SO}_4]$; in soil; as a nutrient and dietary supplement; and as a filler or glaze in paints, enamels, paper, pharmaceuticals, yeast manufacture, insecticide dusts, water treatment, and polishing powders.

Manufacturer Always request an up-to-date MSDS from your chemical supplier. That sheet should include the substance's manufacturer and emergency phone numbers. This *Manual's* Resources/Manufacturers Index lists some larger manufacturers and available emergency phone numbers.

◆ SECTION 2 USE AND STORAGE DATA

Preliminary Planning Considerations Plan and provide for safe disposal of all school-generated chemical waste. Check applicable regulations prior to use. Wear rubber gloves to minimize skin contact. Provide adequate ventilation. Contact lens use in the laboratory is controversial. In some cases, soft lenses can actually protect eyes from chemicals. In other cases, chemical entrapment is presumed a possible hazard. Particles adhering to contact lens surfaces can cause corneal damage. For safety, always wear safety glasses or goggles. Employees and students should know the location of eyewash and shower facilities near where chemicals are used. Be sure eyewash stations and safety showers are in good working order.

Usage Precautions and Procedure Before using, read this material's container label and follow all precautions. Do not smoke in usage or storage areas. Practice good housekeeping to avoid unintentionally mixing incompatibles. Do not allow chemical residue or dust buildup in lab or work areas. Wear appropriate protective clothing to work with this substance. Keep this material away from notebooks, textbooks, and personal belongings to avoid transporting chemical residues from the lab/work area. After working with chemical materials, and before eating, drinking, or smoking, always wash hands and face. Remove and launder contaminated clothing before reusing.

Additional Data Calcium sulfate is stable at room temperature under normal handling and storage conditions. It does not polymerize. Its incompatibilities include aluminum when heated. At high temperatures, calcium sulfate and phosphorus mixtures ignite. This material and diazomethane are exothermic (heat producing) and eventually explode.

Preferred Storage Location and Methods Store in closed containers in cool, dry, well-ventilated area away from aluminum, diazomethane, and phosphorus. To separate incompatible chemicals, store by chemical family, not by alphabetical name. Protect all chemical containers from physical damage. Prohibit smoking in chemical storage areas. Purchase amounts equal to only a year's needs, if at all.

◆ SECTION 3 SPILL/DISPOSAL PROCEDURES

If Spilled Ventilate spill area. Clean up spilled material promptly and thoroughly. Cleanup personnel should protect against skin or eye contact and dust inhalation. Carefully collect and scoop the spilled dry material into secure disposal or reclamation containers. Avoid creating airborne dust conditions. Sweep, vacuum (with an appropriate filter), or wet mop to minimize dust dispersion.

Disposal of Small Quantities Handle emptied containers carefully since residues may remain. Always check regulations before disposal. Investigate recycling, reclamation, or destruction to a less hazardous material rather than disposal of untreated waste to a landfill. If this method is not practical, feasible, or in accord with existing regulations, contact your supplier or a licensed disposal contractor for specific treatment/disposal procedures.

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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

Calcium sulfate is considered a nuisance dust. Inhaling this material is irritating to the upper respiratory tract. Calcium sulfate is also irritating to the skin and eye. Conjunctivitis can occur. Ingestion of a sufficient quantity could lead to mechanical obstruction of the gut. A 0.5 to 5.0 g/kg dose is probably lethal to humans.

1990-91 ACGIH TLV 8-hr TWA: 10 mg/m³

1990 NIOSH REL None established

1990 OSHA PEL 8-hr TWA: 5 mg/m³ (respirable fraction), 15 mg/m³ (total dust)

1985-6 Toxicity Data None listed

Carcinogenicity Not listed by the NTP, IARC, or OSHA

Acute Effects Inhalation of calcium sulfate dust irritates the upper respiratory tract (pharynx and trachea) and inflames the nose's mucous membrane (rhinitis) with nosebleeds. Direct contact with the skin and eyes causes irritation and conjunctivitis, respectively.

Chronic Effects Cases of chronic rhinitis, laryngitis, pharyngitis, and impaired sense of smell and taste are reported.

◆ SECTION 5 FIRST AID PROCEDURES

Eye Contact Promptly flush eyes with plenty of running water for at least 15 min, including under the eyelids. Get prompt medical attention.

Skin Contact Thermal burns may occur during the hardening of calcium sulfate. Quickly remove contaminated clothing. After flushing with large amounts of water, wash exposed areas with soap and water.

Inhalation Remove victim from exposure to fresh air and support breathing as necessary.

Ingestion Get prompt medical attention. Never give anything by mouth to an unconscious or convulsing person. If ingested, have a conscious person drink 1 to 2 glasses of water, then induce vomiting.

Get proper in-school, paramedic, or community medical attention and support.

◆ SECTION 6 FIRE PROCEDURES AND DATA

Fire Hazards None reported. Calcium sulfate is non-combustible.

Since fire may produce toxic fumes, a self-contained breathing apparatus (SCBA) and full protective gear is recommended.

Flash Point and Method None reported

Autoignition Temperature None reported

Flammability Limits in Air (vol. %) None reported

Hazardous Decomposition Products Thermal oxidative decomposition of calcium sulfate can produce toxic fumes of sulfur oxides (SO_x).

Extinguishing Media Use media appropriate to surrounding fire conditions.

◆ SECTION 7 PHYSICAL DATA

Melting Point (at 1 atm) 2642 °F (1450 °C)

Solubility in Water (at 25 °C) Slightly soluble (pure anhydrous), 0.24% soluble in water

Molecular Weight 136.14

Specific Gravity (H₂O = 1) 2.960

References 7, 73, 84, 87, 89, 100, 103, 109, 123, 124, 126, 127, 134, 136; Genium's *Material Safety Data Sheets Collection*, No. 127(4/90)

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