



MSDS - Sulphur

Issued October 25, 2007

Section 1. Product Information

Trade Name & Synonyms: Sulphur, Flake sulfur, Granular sulfur

Chemical Name: Sulfur

Family Element: Sulfur

Chemical Formula: S₈ (Rhombic or monoclinic)

CAS No.: 7704-34-9

Distributed by Pestell Minerals & Ingredients, New Hamburg, ON Canada

24 Hour Emergency Telephone (Canutec): 613-996-6666

Section 2. Hazardous Ingredients

Sulfur - 99.5% minimum by weight

CAS #7704-34-9

Section 3. Physical Data

Appearance: Yellow colored lumps, flakes or formed shape

Odor: Odorless, or faint odor of rotten eggs

Vapor Pressure: 0mmHG at 280°C

Solubility in Water: Insoluble

Specific Gravity: 2.07 @ 70°F

Boiling Point: 832°F (444°C)

Freezing/Melting Point: 230-246°F (110-119°C)

Bulk Density: Lumps 75-115lbs./ft³ Powder 33-80lbs./ft³

Section 4. Fire or Explosion Hazard

Flashpoint: 405°F (207.2°C)

Explosive Limits of Dust in Air: LEL 35g/m³ UEL 1400 g/m³

Auto-Ignition Temperature: 478-511°F (248-266°C)

Extinguishing Media: Water fog, spray or regular foam. Do not use a direct water stream.

Burning Sulfur decomposes into TOXIC sulfur oxide gasses such as Sulfur dioxide (SO₂) and Hydrogen sulfide (H₂S)

Primary Hazard:

Sulfur dust suspended in air ignites easily, and can cause an explosion in confined areas. May be ignited by friction, static electricity, heat, sparks or flames. Toxic gases will form upon combustion. Bulk/solid forms burn only at moderate rate, whereas dust burns with explosive violence.

Fire

Wear full faced, self contained breathing apparatus and full protective clothing. Use a water fog to extinguish fire. Do not use solid streams of water; which would create sulfur dust clouds and cause an explosion or move burning sulfur to adjacent areas. Fire will rekindle until mass is cooled below 310°F (154°C). Cool surrounding areas with water fog to prevent re-igniting. Cool containers, tank cars, or trailer loads with flooding quantities of water until well after fire is out. Evacuate nonessential personnel from the fire area. If large fire, evacuate people downwind from fire. Isolate for 1/2 mile in all directions, consider evacuation for 1/2 mile in all directions. Prevent human exposure to smoke, fumes, or product combustion (sulfur oxide gases). Firemen exposed to contaminated smoke should be immediately relieved and checked for symptoms of exposure to toxic gasses. **Seek medical attention immediately!** This should not be mistaken for heat exhaustion or smoke inhalation. These are extremely irritating to the respiratory tract and may cause breathing difficulty and pulmonary edema. Symptoms may be delayed several hours or longer depending upon exposure.

Section 5. Reactivity Data

Stability: Stable

Conditions to Avoid (Instability): Keep from heat sources, sparks and open flames

Materials to Avoid (Incompatibility): Oxidizing agents, may react violently. Corrosive to copper and

copper alloys. Damp sulfur will corrode steel.

Hazardous Polymerization: Will not occur

Hazardous Decomposition Products: Oxides of sulfur gasses produced by burning sulfur

Section 6. Toxicological Properties

Exposure Limits: Particulates (NOC): 10mg/m³ total dust (TLV/TWA) ACGIH

Toxicology:

Oral LD₅₀ (Rats): >5050 mg/kg body weight

Dermal LD₅₀ (Rats): >2020 mg/kg body weight

Inhalation @ 90% LC₅₀ (Rats): >5.49 mg/L air concentration

Skin Effects (Rabbits): Slightly irritating

Eye Effects (Rabbits): Minimal irritation in non-washed eyes

Carcinogenicity, Teratogenicity, Mutagenicity: This product does not contain any ingredient designated by NTP, IARC or OSHA as a probable human carcinogen.

Hazard Rating

Acute Health = 1 Fire = 1 Reactivity = 0 Contact = 1

Sulfur is essentially non-toxic either through ingestion, inhalation, skin or eye contact. Individuals with known allergies to sulfide drugs may also have allergic reactions to elemental sulfur.

Signs and Symptoms of Overexposure

Nose or throat irritation, coughing, chest discomfort, asthma, difficulty breathing, nausea, vomiting, stinging eye irritation, skin irritation, hives

Skin Contact: No adverse effects. Skin irritation may be aggravated in persons with existing skin lesions. Was exposed clothing separately before reuse.

Eye Contact: Sulfur dust is an eye irritant. Avoid contact with eyes, especially contact wearers. Wear safety glasses.

Inhalation: Prolonged inhalation may cause irritation of the respiratory tract. Breathing of dust may aggravate asthma and other pulmonary diseases. Individuals with known allergies to sulfide drugs may also have allergic reactions to elemental sulfur. Maintain adequate ventilation in area where dust is present. Wear dust masks and use NIOSH/MSHA approved respirator if airborne concentrations

exceed exposure limits.

Ingestion: Ingested sulfur is converted to sulfides in the gastrointestinal tract and ingestion of 10 to 20 grams has caused irritation of the GI tract and renal injury. Individuals with known allergies to sulfide drugs may also have allergic reactions to elemental sulfur. Swallowing large amounts may cause nausea and vomiting. Do not eat sulfur.

Section 7. Preventive Measures

Storage: Containers should be stored in a cool, dry, well ventilated area. Keep container tightly closed. Store away from flammable materials, sources of heat, flame and sparks. Separate from chlorates, nitrates and other oxidizing agents. Exercise due caution to prevent damage to or leakage from container.

Explosion Hazard: Avoid any conditions that might tend to create a dust explosion. Be careful not to create dust. Maintain good housekeeping practices to minimize dust build-up and dispersion. Eliminate sources of ignition. Keep away from heat, sparks and flames. Use nonferrous tools to reduce sparking. Sweep or shovel up spilled material using a natural fiber broom and/or aluminum shovel to prevent sparking. Maintain adequate ventilation in all areas.

Small or Large Spills: No flares or flames in area. No smoking. Danger of dust explosion near sparks. Sweep or shovel up spilled material using a natural fiber broom and/or aluminum shovel to prevent sparking. Place sweepings in an appropriate chemical waste container for reclaiming or disposal in an approved facility. Wash spill site after clean up is complete. Do not allow runoff to enter lakes, rivers or public waterways. May be harmful to aquatic life, aquatic toxicity rating = >100ppm (96 hours) freshwater. Spill area must be cleaned and restored to original condition to the satisfaction of authorities. Provincial regulations require that environmental agencies be notified of a spill. Wear protective clothing during clean up: safety glasses, rubber gloves, impervious clothing, dust mask or respirator.

Work Area

- Protective equipment should be used during the following procedures:
- Manufacture or formulation of this product
- Repair and maintenance of contaminated equipment
- Clean up of leaks and spills
- Any situation which may result in hazardous exposure

Maintain adequate ventilation and wear a respirator or a dust mask to prevent inhalation. Wear suitable, protective clothing and safety glasses to prevent skin and eye irritation from dust. Maintain a sink, safety shower and eyewash fountain in the work area. Wash skin thoroughly after handling and before eating or smoking. Wash contaminated clothing separately before reuse.

Section 8. First Aid Measures

Skin: Wash skin with plenty of mild soap and water

Eye: In case of contact, immediately flush eyes with plenty of water for a minimum of fifteen minutes. Hold upper and lower lids apart to insure rinsing of the entire eye surface and lids. **Do not use boric acid to rinse with; sulfur is an acid irritant.** For severe irritation, get medical attention, preferably an ophthalmologist.

Inhalation: Move patient to fresh air. Watch for signs of allergic reaction. Use a bronchodilator inhaler if directed by asthma patient. Keep victim warm and quiet. If not breathing, clear airway and start mouth to mouth resuscitation. If heart has stopped beating, start cardiopulmonary resuscitation (CPR). Get medical attention.

Ingestion: For large amounts ingested, if the victim is conscious and alert, give two or more glasses of water to drink. If available, give one tablespoon of Syrup of Ipecac to induce vomiting. If vomiting does not occur, give fluids again. If vomiting has not occurred in twenty minutes, the same dose of Syrup of Ipecac may be repeated one additional time. Alternatively, vomiting may be induced by touching the back of the throat with a finger. Do not give anything by mouth to an unconscious or convulsing person. Get medical attention.

Section 9. DOT & Regulatory Information

Environmental: No Canadian Federal standards. This product, or all components, are listed on the Domestic Substances List (DSL), as required under the Canadian Environmental Protection Act.

Biodegradability: Not applicable

WHMIS: This product is not a WHMIS controlled substances

TDG: Special Provision 22: A person who handles, offers for transport or transports these dangerous goods is not required to comply with these Regulations if the dangerous goods (a) are in a quantity of less than 400 kg; or

(b) have been formed to a specific shape such as prills, granules, pellets, pastilles or flakes.

Shipping Name: Sulfur

Hazard Class: None required

ID Number: None required

Packing Group: None required

Label: None required

Placard: None required

Hazardous Substance/Rq: Not applicable

Disclaimer

This information contained herein is accurate to the best of our knowledge. We do not suggest or guarantee that any hazards listed herein are the only ones which exist. Pestell Minerals & Ingredients makes no warranty of any kind, expressed or implied, concerning the safe use of this material in your process or combination with any other substances. Effects can be aggravated by other materials and/or this material may aggravate or add to the effects of other materials. This material may be released from gas, liquid or solid materials made directly or indirectly from it. User has the sole responsibility to determine the suitability of the materials for any use and the manner of use contemplated. User must meet all applicable safety and health standards.