Sulphur (Sulfur)

UN 1350; Sulfur, lump and coarse grained powder, or fine grained powder; Sulfur, molten
UN 2448; Sulfur, molten

CAS Registry number: 7704-34-9

Reference Source of Information: WISER database (HHS/NIH, National Library of Medicine)

Hazard Summary:
The major hazards encountered in the use and handling of sulfur stem from its toxicologic properties and flammability. Toxic by all routes (ie, inhalation, ingestion, and dermal contact), exposure to this pale yellow, crystalline substance may occur from the extraction of sulfur-bearing rock, its use in fertilizer, the production of sulfuric acid and other sulfur compounds, in wood pulping, in the vulcanization of rubber, and in the manufacture of matches, explosives, and dyes.
Effects from exposure may include ulceration of the skin, conjunctivitis, inflammation of the nasal mucosa, shortness-of-breath, asthma, and tracheobronchitis. In activities and situations where over-exposure may occur, wear chemical protective clothing and a self-contained breathing apparatus. If exposure should occur, immediately irrigate eyes with copious amounts of tepid water for at least 15 minutes and wash skin extremely thoroughly with soap and water. Contaminated clothing should be removed and left at the work site for cleaning before reuse.
Sulfur is an easily ignitable solid. In a powdered form it may form explosive mixtures with air, or in contact with oxidizing materials. Sulfur burns with a blue flame that may be difficult to see in daylight, and produces toxic sulfur dioxide gas. For fires involving sulfur, extinguish with dry chemical, sand, water spray (straight streams may scatter the material), fog, or standard foam. If water is used, apply from as far a distance as possible. Sulfur should be stored in a cool, well ventilated area, away from sources of ignition, physical damage, chlorates, nitrates, and other oxidizing materials.
Small dry spills of sulfur may be carefully shovelled into a clean, dry, covered container for recovery or later disposal. Large spills may be wetted down with water and diked for later disposal. Do not allow material to enter water sources or sewers.

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PUBLIC SAFETY

· As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions.

EVACUATION

Large Spill
Consider initial downwind evacuation for at least 100 meters (330 feet).

Fire
If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

Emergency guidelines

FLAMMABLE SOLIDS

POTENTIAL HAZARDS

FIRE OR EXPLOSION

· Flammable/combustible material.

· May be ignited by friction, heat, sparks or flames.
· Some may burn rapidly with flare burning effect.
· Powders, dusts, shavings, borings, turnings or cuttings may explode or burn with explosive violence.
· Substance may be transported in a molten form at a temperature that may be above its flash point.
· May re-ignite after fire is extinguished.

HEALTH
· Fire may produce irritating and/or toxic gases.
· Contact may cause burns to skin and eyes.
· Contact with molten substance may cause severe burns to skin and eyes.
· Runoff from fire control may cause pollution.

PUBLIC SAFETY
. As an immediate precautionary measure, isolate spill or leak area for at least 25 meters (75 feet) in all directions. (Specialist services)
· Keep unauthorized personnel away.
· Stay upwind.
· Keep out of low areas.

PROTECTIVE CLOTHING (specialised response teams!)
· Wear positive pressure self-contained breathing apparatus (SCBA).
· Structural firefighters' protective clothing will only provide limited protection.

EVACUATION
Large Spill
· Consider initial downwind evacuation for at least 100 meters (330 feet).
Fire
· If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.

EMERGENCY RESPONSE

Fire
Small Fire
· Dry chemical, CO2, sand, earth, water spray or regular foam.
Large Fire
· Water spray, fog or regular foam.
· Move containers from fire area if you can do it without risk.
Fire Involving Metal Pigments or Pastes (e.g. "Aluminum Paste")
· Aluminum Paste fires should be treated as a combustible metal fire. Use DRY sand, graphite powder, dry sodium chloride based extinguishers,

Fire involving Tanks or Car/Trailer Loads
· Cool containers with flooding quantities of water until well after fire is out.
· For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
· Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
· ALWAYS stay away from tanks engulfed in fire.

SPILL OR LEAK
· ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
· Do not touch or walk through spilled material.
Small Dry Spill
· With clean shovel place material into clean, dry container and cover loosely; move containers from spill area.
Large Spill
· Wet down with water and dike for later disposal.
· Prevent entry into waterways, sewers, basements or confined areas.

FIRST AID
· Move victim to fresh air.
· Call emergency medical service.
· Give artificial respiration if victim is not breathing.
· Administer oxygen if breathing is difficult.
· Remove and isolate contaminated clothing and shoes.
· In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
· Removal of solidified molten material from skin requires medical assistance.
· Keep victim warm and quiet.
· Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Medical treatment overview:

0.4.2 ORAL EXPOSURE

- A) EMESIS: Ipecac-induced emesis is not recommended because of the potential for CNS depression and seizures.
- B) GASTRIC LAVAGE: Consider after ingestion of a potentially life-threatening amount of poison if it can be performed soon after ingestion (generally within 1 hour). Protect airway by placement in Trendelenburg and left lateral decubitus position or by endotracheal intubation. Control any seizures first.
    - 1) CONTRAINDICATIONS: Loss of airway protective reflexes or decreased level of consciousness in unintubated patients; following ingestion of corrosives; hydrocarbons (high aspiration potential); patients at risk of hemorrhage or gastrointestinal perforation; and trivial or non-toxic ingestion.
- C) ACTIVATED CHARCOAL: Administer charcoal as a slurry (240 mL water/30 g charcoal). Usual dose: 25 to 100 g in adults/adolescents, 25 to 50 g in children (1 to 12 years), and 1 g/kg in infants less than 1 year old.
- D) Patients should be monitored and treated symptomatically. Effects are variable depending on the route and amount of exposure. Hydrogen sulfide has been produced following ingestions of lime sulfur.
- E) Skin and eye irritation are possible following minor exposures. Moderate to severe effects can occur after large ingestions and result in gastrointestinal irritation and mucosal burns, as well as, cardiac, respiratory, and central nervous system effects.
- F) ACUTE LUNG INJURY: Maintain ventilation and oxygenation and evaluate with frequent arterial blood gas or pulse oximetry monitoring. Early use of PEEP and mechanical ventilation may be needed.

0.4.3 INHALATION EXPOSURE

- A) INHALATION: Move patient to fresh air. Monitor for respiratory distress. If cough or difficulty breathing develops, evaluate for respiratory tract irritation, bronchitis, or pneumonitis. Administer oxygen and assist ventilation as required. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids.

0.4.4 EYE EXPOSURE

- A) DECONTAMINATION: Irrigate exposed eyes with copious amounts of room temperature water for at least 15 minutes. If irritation, pain, swelling, lacrimation, or photophobia persist, the patient should be seen in a health care facility.

0.4.5 DERMAL EXPOSURE

- A) OVERVIEW
    - 1) DECONTAMINATION: Remove contaminated clothing and wash exposed area thoroughly with soap and water. A physician may need to examine the area if irritation or pain persists.