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Material Safety Data Sheet

Sulphur

Section 1 : Product Identification

Product Name : Sulphur

Chemical Formula : S_8

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Section 2 : Composition/Information on Ingredients

Ingredient	CAS No.	% by Weight
Sulphur	7704-34-9	99.5 (min)

Section 3 : Hazards Identification

- Highly flammable and combustible Solid. A nuisance dust. Crystalline sulphur deposits and dust are readily ignitable. Forms explosive mixtures with charcoal and oxidizing agents. Thermal decomposition will evolve with large quantities of sulphur dioxide.
- In dry state can form electrostatic charge if stirred, transported pneumatically or poured.
- Contact could cause burns to skin and eyes.
- Fire could produce irritating or Sulphur dioxide (SO_2) gas. Threshold Limit value (TLV) of 2ppm / Short term exposure limit (STEL) = 5ppm
- Run-off from fire-control or dilution water could cause pollution.
- Eye contact: Irritation and redness.
- Inhalation: sore throat, coughing.
- No recommended dust exposure limit therefore considered a nuisance dust. ACGIH 10mg/m^3 (total dust) or 5mg/m^3 (as respirable dust).

Section 4 : First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Serious Ingestion: Not available.

Section 5 : Fire and Explosion Data

Extinguishing Medias:

Water, water fog, Dry chemical powder fire extinguisher, sand, water spray or foam.

Fires:

Protect product and containers from ignition during nearby fires if possible.

Respiratory equipment: Breathing Apparatus set

Unusual fire and explosion hazards:

Combustion product is sulphur dioxide, an irritating toxic gas which smells like burning match heads. Dust air mixtures are highly flammable / explosive. Sulphur fires are deep blue at night, with very short flames. Fire is invisible in the daylight except for smoke and heat. Burning material turn deep red black.

Section 6 : Accidental Release Measures

Precautions:

Avoid mixtures of air and sulphur dust, sparks or open flames, mixtures of sulphur and oxidizing agents in general, large accumulations of sulphur dust which become airborne in an explosion or process disruption caused by other materials. Examples of oxidizing agents are perchlorates, nitrates, chlorates, permanganates, peroxides, oxygen and etc. Good house keeping is essential to minimize fire danger.

Spill or Leak:

Restrict access to area. Provide adequate protective equipment, ventilation and
have fire fighting equipment at hand. Remove sources of heat, flame and ignition.
Avoid setting fire to spilled material. Avoid creating dust and sparks with tools.
Small spills may be cleaned up with a shovel and broom. Large spills may be cleaned up with front end loaders. Personnel to thoroughly wash all exposed skin areas to prevent irritation from dust.

Environmental:

Do not let spillages enter drains, sewers or water courses. Any spillages into the water courses must be reported to the local regulatory body, of that area.

Section 7 : Handling and Storage

Handling and Storage:

- Handle only with well grounded non-sparking equipment.
- Dry sulphur materials may generate static electricity and sparking.
- Avoid handling sulphur at high velocity in air.
- Control dust formation.

Avoid contact with eyes and dust suspections.

Only use in well ventilated areas.

Do not use near sparking equipment or open flames.

Do not allow large amounts of waste to accumulate.

Do not store near oxidizing materials or near hot equipment.

- In the presence of moisture over long periods of time, sulphur will convert to sulphuric acid which is corrosive to metals, attacks paper, concrete, wood. Store in dry place.

Section 8 : Exposure Controls/Personal Protection

Occupational Exposure Limits: No Exposure Limits Established

Personnel Protective Equipment:

Respiratory protection: Dust mask suitable for use of irritating dust.

Fire: Breathing apparatus shall be worn. Indoor use areas should have sufficient local exhaust to remove dust as it is release into the air. Eye protection must be used.

Clothing: Long sleeves, long pants and gloves assist to keep sulphur off the skin of sensitive persons prone to irritation or dermatitis.

Fire fighting tools should be readily available. Safety shower or eye wash fountain or bottle to beavailable.

Section 9 : Physical and Chemical Properties

Appearance	: Yellow crystals or yellow powder.
Odor	: Odourless when pure, with hydrocarbon impurities, odor of rotten eggs.
Taste	: Vinegar, sour (Strong.)
Boiling Point	: 444.6 °C.
Melting Point	: 119 °C.
Flash Point	: Liquid, pure : 188°C Liquid, impure : as low as 168°C.
Auto ignition Temperature	: Dust in air : 190°C Undispersed : 220°C Non-corrosive when dry. In presence of moisture will attack steel rapidly. Flammable and explosive in finely divided form

Explosive Concentration by Mass in: Minimum : 35 g/cubic meter

Maximum : 1 400 g/cubic meter

AirSection 10 : Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents, reducing agents, metals, acids, alkalis.

Corrosivity: Highly corrosive in presence of stainless steel(304). Slightly corrosive in presence of aluminum, of copper. Non-corrosive in presence of stainless steel(316).

Special Remarks on Reactivity:

Reacts violently with strong oxidizing agents, acetaldehyde, and acetic anhydride. Material can react with metals, strong bases, amines, carbonates, hydroxides, phosphates, many oxides,cyanides, sulfides, chromic acid, nitric acid, hydrogen peroxide, carbonates. ammonium nitrate, ammonium thiosulfate, chlorine trifluoride, chlorosulfonic acid, perchloric acid, permanganates, xylene, oleum, potassium hydroxide, sodium hydroxide, phosphorus isocyanate, ethylenediamine, ethylene imine.

Special Remarks on Corrosivity:

Moderate corrosive effect on bronze. No corrosion data on brass

Polymerization: Will not occur.

Section 11 : Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE.

Acute oral toxicity (LD50): 3310 mg/kg [Rat].

Acute dermal toxicity (LD50): 1060 mg/kg [Rabbit].

Acute toxicity of the vapor (LC50): 5620 1 hours [Mouse].

Chronic Effects on Humans:

MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. May cause damage to the following organs: kidneys, mucous membranes, skin, teeth.

Other Toxic Effects on Humans:

Extremely hazardous in case of inhalation (lung corrosive). Very hazardous in case of skin contact (irritant), of ingestion, . Hazardous in case of skin contact (corrosive, permeator), of eye contact (corrosive).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: May affect genetic material and may cause reproductive effects based on animal data. No human data found.

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects:

Skin:

Extremely irritating and corrosive. Causes skin irritation (reddening and itching, inflammation). May cause blistering , tissue damage and burns.

Eyes:

Extremely irritating and corrosive. Causes eye irritation, lacrimation, redness, and pain. May cause burns,blurred vision, conjunctivitis, conjunctival and corneal destruction and permanent injury.

Inhalation:

Causes severe respiratory tract irritation. Affects the sense organs (nose, ear, eye, taste), and blood. May cause chemical pneumonitis, bronchitis, and pulmonary edema. Severe exposure may result in lung tissue damage and corrosion (ulceration) of the mucous membranes. Inhalation may also cause rhinitis, sneezing, coughing, oppressive feeling in the chest or chest pain, dyspnea, wheezing, tachypnea, cyanosis, salivation, nausea, giddiness, muscular weakness.

Ingestion:

Moderately toxic. Corrosive. Causes gastrointestinal tract irritation (burning and pain of the mouth, throat, and abdomen, coughing, ulceration, bleeding, nausea, abdomial spasms, vomiting, hematemesis, diarrhea. May Also affect the liver (impaired liver function), behavior (convulsions, giddines, muscular weakness), and the urinary system - kidneys (Hematuria, Albuminuria, Nephrosis, acute renal failure, acute tubular necrosis). May also cause dyspnea or asphyxia. May also lead to shock, coma and death.

Chronic Potential Health Effects:

Chronic exposure via ingestion may cause blackening or erosion of the teeth and jaw necrosis, pharyngitis, and gastritis. It may also behavior (similar to acute ingestion), and metabolism (weight loss). Chronic exposure via inhalation may cause asthma and/or bronchitis with cough, phlegm, and/or shortness of breath . It may also affect the blood (decreased leukocyte count), and urinary system (kidneys). Repeated or prolonged skin contact may cause thickening, blackening, and cracking of the skin.

Section 12 : Ecological Information

Ecotoxicity:

Ecotoxicity in water (LC50): 423 mg/l 24 hours [Fish (Goldfish)]. 88 ppm 96 hours [Fish (fathead minnow)]. 75 ppm 96 hours [Fish (bluegill sunfish)]. >100 ppm 96 hours [Daphnia].

BOD5 and COD: BOD-5: 0.34-0.88 g oxygen/g

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation:

The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

Section 13 : Disposal Considerations

Waste Disposal:

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

Section 14 : Transport Information

DOT Classification:

CLASS 3: Flammable liquid.

Class 8: Corrosive material

Identification: : Acetic Acid, Glacial UNNA: 2789 PG: II

Special Provisions for Transport: Not available.

Section 15: Regulatory Information

Federal and State Regulations:

New York release reporting list: Acetic acid

Rhode Island RTK hazardous substances: Acetic acid

Pennsylvania RTK: Acetic acid

Florida: Acetic acid

Minnesota: Acetic acid

Massachusetts RTK: Acetic acid

New Jersey: Acetic acid

California Director's List of Hazardous Subtances (8 CCR 339): Acetic acid

TSCA 8(b) inventory: Acetic acid

CERCLA: Hazardous substances.: Acetic acid: 5000 lbs. (2268 kg) Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):

CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).

CLASS E: Corrosive liquid.

DSCL (EEC):

R10- Flammable.

R35- Causes severe burns.

S23- Do not breathe gas/fumes/vapour/spray

S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S45- In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Section 16 : Other Information

References: Not available.

Other Special Considerations: Not available.

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