

# SULFUR

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## 1. Product Identification

**Synonyms:** Colloidal sulfur; flowers of sulfur; precipitated sulfur; sublimed sulfur; brimstone

**CAS No.:** 7704-34-9

**Molecular Weight:** 256.53

**Chemical Formula:** S<sub>8</sub>

**Product Codes:** CHEM-002

## 2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Sulfur	7704-34-9	100%	Yes

## 3. Hazards Identification

### Emergency Overview

**WARNING! FLAMMABLE SOLID. DUST MAY FORM FLAMMABLE OR EXPLOSIVE MIXTURE WITH AIR. MAY BE HARMFUL IF SWALLOWED OR INHALED. CAUSES EYE IRRITATION. MAY CAUSE IRRITATION TO SKIN AND RESPIRATORY TRACT.**

**SAF-T-DATA**<sup>(tm)</sup> Ratings (Provided here for your convenience)

Health Rating: 1 - Slight (Life)

Flammability Rating: 3 - Severe (Flammable)

Reactivity Rating: 1 - Slight

Contact Rating: 3 - Severe (Life)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES

Storage Color Code: Red (Flammable)

### Potential Health Effects

#### Inhalation:

Nuisance dust. May cause coughing, sneezing or labored breathing if large amounts are inhaled.

#### Ingestion:

Considered essentially non-toxic by ingestion. Ingestion of very large amounts may cause sore throat, nausea, headache, and possibly unconsciousness in severe cases. May be converted into hydrogen sulfide in the intestine.

#### Skin Contact:

May cause irritation.

**Eye Contact:**

Irritant to human eyes at 6-8 ppm. Redness and pain may be observed.

**Chronic Exposure:**

Prolonged overexposure to sulfur dust can produce possible skin sensitization and permanent eye damage (clouding of the lens and chronic irritation). Prolonged inhalation can cause irritation of mucous membranes.

**Aggravation of Pre-existing Conditions:**

Sensitive individuals can experience skin irritation from repeated exposure to sulfur dust. Allergic responses can occur.

## 4. First Aid Measures

**Inhalation:**

Remove to fresh air. Get medical attention for any breathing difficulty.

**Ingestion:**

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person.

**Skin Contact:**

Wash exposed area with soap and water. Get medical advice if irritation develops.

**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

## 5. Fire Fighting Measures

**Fire:**

Flash point: 207C (405F) OC

Autoignition temperature: 232C (450F)

Slight fire hazard when exposed to heat or flame.

**Explosion:**

Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. Explosive limits, dust in air, gm/cu meter: Lower - 35, Upper - 1400. Hazardous in contact with oxidizing materials; forms explosive mixtures.

**Fire Extinguishing Media:**

Use water spray to blanket fire, cool fire exposed containers, and to flush non-ignited spills or vapors away from fire. Solid streams of water should not be used because of possibility of dispersing dust clouds of sulfur in air.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

## 6. Accidental Release Measures

Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container.

## 7. Handling and Storage

Keep in a tightly closed container. Store in a cool, dry, corrosion-proof, ventilated area away from moisture, sources of heat or ignition, combustibles and oxidizers. Protect against physical damage. Avoid dust formation and control ignition sources. Employ grounding, venting and explosion relief provisions in accord with accepted engineering practices in any process capable of generating dust and/or static electricity. Empty only into inert or non-flammable atmosphere. Emptying contents into a non-inert atmosphere where flammable vapors may be present could cause a flash fire or explosion due to electrostatic discharge.

## 8. Exposure Controls/Personal Protection

### **Airborne Exposure Limits:**

None established.

### **Ventilation System:**

In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.

### **Personal Respirators (NIOSH Approved):**

For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

### **Skin Protection:**

Wear protective gloves and clean body-covering clothing.

### **Eye Protection:**

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

### **Other Control Measures:**

Comments: Remove any worker from exposure to sulfur who shows allergic reactions; such individual should not be assigned further work where exposed to sulfur without a physician's approval.

## 9. Physical and Chemical Properties

### **Appearance:**

Fine yellow powder.

### **Odor:**

Faint odor.

### **Solubility:**

Insoluble in water.

### **Specific Gravity:**

2.07 at 20°C (68°F)

### **pH:**

No information found.

### **% Volatiles by volume @ 21°C (70°F):**

0

### **Boiling Point:**

445°C (833°F)

**Melting Point:**

115°C (239°F)

**Vapor Density (Air=1):**

8.9

**Vapor Pressure (mm Hg):**

10 @ 246°C (475°F)

**Evaporation Rate (BuAc=1):**

No information found.

## 10. Stability and Reactivity

**Stability:**

Stable under ordinary conditions of use and storage. Transition temperature is about 95C (203F) (slow conversion) between alpha and beta crystalline forms.

**Hazardous Decomposition Products:**

Burning may produce sulfur oxides.

**Hazardous Polymerization:**

Will not occur.

**Incompatibilities:**

Chlorates, nitrates and other oxidizing agents. Halogens, carbides, zinc, tin, alkali metals, phosphorus, ammonia, ammonium nitrate, charcoal and many other substances.

**Conditions to Avoid:**

Heat, flame, ignition sources, dusting and incompatibles.

## 11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

Irritation: eye human: 8 ppm.

Ingredient	\Cancer Lists\ —NTP Carcinogen—		
	Known	Anticipated	IARC Category
Sulfur (7704-34-9)	No	No	None

## 12. Ecological Information

**Environmental Fate:**

No information found.

**Environmental Toxicity:**

This material is not expected to be toxic to aquatic life. The LC50/96-hour values for fish are over 100 mg/l.

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

## 14. Transport Information

International (Water, I.M.O.)

Proper Shipping Name: SULPHUR

Hazard Class: 4.1

UN/NA: UN1350

Packing Group: III

Information reported for product/size: 100LB

## 15. Regulatory Information

----- \Chemical Inventory Status - Part 1\ -----

Ingredient	TSCA	EC	Japan	Australia
Sulfur (7704-34-9)	Yes	Yes	No	Yes

----- \Chemical Inventory Status - Part 2\ -----

-----Canada-----

Ingredient	Korea	DSL	NDSL	Phil.
Sulfur (7704-34-9)	Yes	Yes	No	Yes

----- \Federal, State & International Regulations - Part 1\ -----

-----SARA 302- -----SARA 313-----

Ingredient	RQ	TPQ	List	Chemical Catg.
Sulfur (7704-34-9)	No	No	No	No

----- \Federal, State & International Regulations - Part 2\ -----

-----RCRA- -TSCA-

Ingredient	CERCLA	261.33	8(d)
Sulfur (7704-34-9)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No

SARA 311/312: Acute: Yes Chronic: No Fire: Yes Pressure: No

Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** 2[Z]

**Poison Schedule:** None allocated.

**WHMIS:**

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

## 16. Other Information

**NFPA Ratings:** Health: 2 Flammability: 1 Reactivity: 0

**Label Hazard Warning:**

WARNING! FLAMMABLE SOLID. DUST MAY FORM FLAMMABLE OR EXPLOSIVE MIXTURE WITH AIR. MAY BE HARMFUL IF SWALLOWED OR INHALED. CAUSES EYE IRRITATION. MAY CAUSE IRRITATION TO SKIN AND RESPIRATORY TRACT.

**Label Precautions:**

Keep away from heat, sparks and flame.  
Avoid breathing dust.  
Keep container closed.  
Use with adequate ventilation.  
Avoid dust cloud in presence of an ignition source.  
Avoid contact with eyes, skin and clothing.  
Wash thoroughly after handling.

**Label First Aid:**

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. If inhaled, remove to fresh air. Get medical attention for any breathing difficulty. In all cases call a physician.

**Product Use:**

Laboratory Reagent, Pyrotechniques and Consumer Hobby

**Revision Information:**

No Changes.

**Disclaimer:**

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