



# Sulfur

## Safety Data Sheet

Version 004 — Last revision on 2015-02-27

### SECTION 1 — IDENTIFICATION

Product Name: Sulfur  
Product ID: CNX-004  
Synonyms: None  
Molecular Formula: S  
Chemical Family: Pure element  
Product Use: Petroleum refining product  
Manufacturer: CHS, Inc.  
P.O. Box 909  
Laurel, Montana 59044, USA  
Telephone: 406.628.5200 (*General*)  
800.424.9300 (*Emergency – Within USA & Canada*)

### SECTION 2 — HAZARD(S) IDENTIFICATION

#### Emergency Overview

#### WARNING



Flammable solid (H228).  
May be harmful if swallowed (H303).  
May be harmful in contact with skin (H313).  
Causes skin irritation (H315).  
May be harmful if inhaled (H333).

#### PREVENTION

Do not handle until all safety precautions have been read and understood (P202).  
Keep away from heat, sparks, open flames, hot surfaces, etc. No smoking (P210).  
Use explosion-proof equipment (P241).  
Wash hands thoroughly after handling (P264).  
Wear gloves and eye protection (P280).

Use personal protective equipment as required (P281).

#### RESPONSE

IF ON SKIN: Wash with plenty of soap and water (P302 + P352).

IF INHALED: Call a poison center or doctor/physician if you feel unwell (P304 + P312).

Call a poison center or doctor/physician if you feel unwell (P312).

IF SKIN IRRITATION OCCURS: Get medical advice/attention (P332 + P313).

Take off contaminated clothing and wash before reuse (P362).

IN CASE OF FIRE: Use water spray, alcohol-resistant foam, dry chemical, or carbon dioxide for extinction (P370 + P378).

### Hazard Classifications (OSHA / GHS)

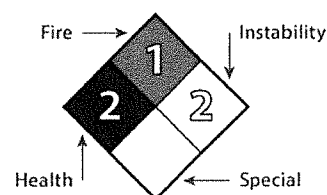
Acute toxicity, dermal – Category 5

Acute toxicity, inhalation – Category 5

Acute toxicity, oral – Category 5

Skin corrosion/irritation – Category 2

### NFPA



### Potential Health Effects

Eye Health Effects: Causes eye irritation.

Skin Health Effects: May be harmful if absorbed through skin. Causes skin irritation.

Inhalation Health Effects: May be harmful if inhaled. Causes respiratory tract irritation. Combustion generates dangerous sulfur dioxide (SO<sub>2</sub>). Additionally, molten sulfur reacts with hydrocarbons to form carbon disulfide and hydrogen sulfide (H<sub>2</sub>S), which are highly toxic gases. Exposure to high concentrations of H<sub>2</sub>S (> 1000 ppm) will cause immediate unconsciousness and death through respiratory paralysis. Signs and symptoms of overexposure to hydrogen sulfide include respiratory and eye irritation, dizziness, nausea, coughing, a sensation of dryness and pain in the nose, and loss of consciousness. Odor does not provide a reliable indicator of the presence of hazardous levels in the atmosphere.

Ingestion Health Effects: May be harmful if swallowed.

Carcinogenic Effects: Not a suspected carcinogen.

### Potential Environmental Effects

Environmental Effects: Spills into watercourses may be harmful to organisms and bottom feeders.

## SECTION 3 – COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Ingredients				
Name	CAS #	RTECS #	EINECS #	% (Weight)
Sulfur	7704-34-9	WS4250000	231-722-6	< 99

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**SECTION 4 — FIRST-AID MEASURES**

NOTE: See *Section 11* for symptoms and effects.

**Eye Contact**

Flush eyes immediately with clear water for at least 15 minutes. Remove contact lenses if present and easy to do. If irritation persists, seek medical attention.

**Skin Contact**

Wash area of contact thoroughly with soap and plenty of water. If irritation persists, seek medical attention.

**Inhalation**

If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air. If breathing difficulties develop, oxygen should be administered by qualified personnel. If victim is not breathing, clear airway and immediately begin artificial respiration. Seek immediate medical attention.

**Ingestion**

Do not induce vomiting. Seek medical attention.

**Notes to Physicians**

This material may liberate hydrogen sulfide (H<sub>2</sub>S). At high concentrations H<sub>2</sub>S may produce pulmonary edema, respiratory depression, and/or respiratory paralysis. The first priority in treatment should be the establishment of adequate ventilation and the administration of 100% oxygen. Nitrite therapy (found in the cyanide antidote kit) has been suggested as a therapy for H<sub>2</sub>S exposure. Amyl nitrite is given by inhalation (for 30 seconds every minute until an intravenous line is established) followed by intravenous sodium nitrite (300 mg over absolutely no less than 5 minutes). This may aid recovery by forming sulfmethemoglobin, thus removing sulfide from combination in tissue. The antidotal efficacy of nitrite therapy is controversial, but is currently recommended if it can be started within the first few minutes after exposure. Nitrite therapy should not be allowed to interfere with the establishment of adequate ventilation and oxygenation. (*Source: ATSDR Toxic Substances Portal – Hydrogen Sulfide*).

**Medical Conditions Aggravated by Exposure**

*Not available.*

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**SECTION 5 — FIRE-FIGHTING MEASURES****NFPA 704 Hazard Classes:**

Health: 2 (Moderate)  
Flammability: 1 (Slight)  
Instability: 2 (Moderate)  
Other Hazards: Not applicable

### Unusual Fire and Explosion Hazards

Flammable in the presence of a source of ignition, or through friction or retained heat. Dust may form explosive mixtures in air. This dust cloud may be exploded by flame or spark.

### Extinguishing Media

Use water spray, alcohol-resistant foam, dry chemical, or carbon dioxide.

### Protection of Firefighters

Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Wear self-contained breathing apparatus. In addition, wear other appropriate protective equipment as conditions warrant (see *Section 8*).

### Firefighting Procedures

Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Use fine spray or fog to control fire by preventing its spread and absorbing some of its heat. Use water spray to keep fire-exposed containers cool. Water or foam may cause frothing of molten sulfur. Extinguish fire using agent suitable for surrounding fire. Dry chemical extinguishers may not extinguish this type of fire. Fire watch should be posted for a minimum of four (4) hours after any fire.

### Other Information

Combustion Products: Sulfur dioxide, carbon disulfide, fumes, smoke, carbon monoxide, and aldehydes.

Flammable Properties: See *Section 9* for Flash Point, Explosive Limits, etc.

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## SECTION 6 — ACCIDENTAL RELEASE MEASURES

### Personal Precautions

Use personal protective equipment. Avoid dust formation. Avoid breathing dust, vapors, mist, or gas. Ensure adequate ventilation. Wear appropriate protective equipment as conditions warrant (see *Section 8*).

### Environmental Precautions

Do not let material enter drains. Assure conformity with applicable government regulations.

### Containment Procedures

*Not available.*

### Clean-up Procedures

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

## SECTION 7 — HANDLING AND STORAGE

### Handling

Keep product away from heat, sparks, pilot lights, static electricity, and open flame. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust may be formed.

### Storage

Keep container tightly closed in a dry and well-ventilated place. Keep dry.

## SECTION 8 — EXPOSURE CONTROLS / PERSONAL PROTECTION

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, and/or engineering professionals.

### Personal Protective Equipment



- Respiratory Protection:** For nuisance exposures, use type P95 particle respirator. For higher level protection, use type OV/AG/P99 respirator cartridges. Use respirators and components tested and approved under appropriate government standards, such as NIOSH.
- Eye/Face Protection:** The use of eye protection (such as safety glasses) that meets or exceeds ANSI Z.87.1 is recommended. Depending on conditions of use, a face shield may be necessary.
- Skin Protection:** Wear gloves to protect against skin contact. Depending on conditions of use, additional protection may be necessary to prevent skin contact, such as face shield, apron, body suit, long sleeves, etc.
- General Considerations:** When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Handle in accordance with good industrial hygiene and safety practice.

### Engineering Controls

Provide ventilation sufficient to prevent exceeding recommended exposure limits or buildup of explosive concentrations of dust in air. Use explosion-proof equipment.

**Exposure Limits / Guidelines**

Component	ACGIH TLV	NIOSH REL	OSHA PEL
Nuisance dust, total	TWA: 10 mg/m <sup>3</sup>	---	TWA: 15 mg/m <sup>3</sup>

Note: State, local, or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

**SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES**

Physical Form	Powder
Appearance	Light yellow
Odor	Slight-sweet to mercaptan
Odor Threshold	<i>Not available</i>
pH	<i>Not available</i>
Freezing Point	243 – 248 °F (117 – 120 °C)
Boiling Point	832.5 °F (445 °C)
Flash Point	334 °F (168 °C) by closed cup
Flammability	Flammable
Explosive Limits	0.17 % (LEL) – 6.83 % (UEL)
Evaporation Rate	<i>Not available</i>
Vapor Pressure	8 mmHg at 475 °F (246 °C); 1 mmHg at 363 °F (184 °C)
Vapor Density	<i>Not available</i>
Specific Gravity	<i>Not available</i>
Density	2.05 g/cm <sup>3</sup>
Solubility	Insoluble
Partition Coefficient	<i>Not available</i>
Auto-ignition Temperature	450 °F (232 °C)
Decomposition Temperature	<i>Not available</i>
Viscosity	<i>Not available</i>
Molecular Formula	S
Molecular Weight	32.07 g/mol

## SECTION 10 — STABILITY AND REACTIVITY

Stability:	Stable under normal temperature conditions and recommended use.
Conditions to Avoid:	Heat, flames and sparks; extremes of temperature and direct sunlight.
Incompatible Materials:	Strong oxidizing agents, amines, and bases.
Hazardous Polymerization:	Not known to occur.

## SECTION 11 — TOXICOLOGICAL INFORMATION

### General Toxicity

Signs and Symptoms:	Burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, vomiting, dermatitis.
Aspiration Hazard:	<i>Not available.</i>
Sensitization:	<i>Not available.</i>
Specific Target Organs:	<i>Not available.</i>
Carcinogenicity:	Not identified as a possible, probable, or confirmed carcinogen.
Germ Cell Mutagenicity:	<i>Not available.</i>
Reproductive Toxicity:	<i>Not available.</i>

### Other Comments

None.

### Toxicological Effects of Components

Toxicological Information		
Component	Category	Data
Sulfur (7704-34-9)	Toxicity	Dermal LD50: >2000 mg/kg (rabbit); Oral LD50: >5000 mg/kg (rat); Inhalation LC50: >9.23 mg/L/4 hours (rat).
	Exposure Routes	<i>Not available.</i>
	Symptoms	<i>Not available.</i>
	Target Organs	<i>Not available.</i>
	Short-Term Exposure	Irritates the eyes, the skin, and the respiratory tract. Inhalation of powder of this substance may cause inflammation of the nose and the respiratory tract.
	Long-Term Exposure	Repeated or prolonged contact with skin may cause dermatitis. May have effects on the respiratory tract, resulting in chronic bronchitis.

Note: Data for Toxicity were obtained from the U.S. National Library of Medicine TOXNET. Data for Exposure Routes, Symptoms, and Target Organs were obtained from the NIOSH Pocket Guide to Chemical Hazards. Data for Short- and Long-Term Exposure were obtained from the International Chemical Safety Cards from the International Occupational Safety and Health Information Centre.

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## SECTION 12 — ECOLOGICAL INFORMATION

Toxicity: *Not available.*  
Persistence & Degradability: *Not available.*  
Bioaccumulative Potential: *Not available.*  
Mobility: *Not available.*  
Other Adverse Effects: *Not available.*

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## SECTION 13 — DISPOSAL CONSIDERATIONS

The generator of a waste is always responsible for making proper hazardous waste determinations. The transportation, storage, treatment, and disposal of this waste material must be conducted in compliance with all applicable federal, state, and local requirements and regulations.

This material, when discarded or disposed of as produced, is not specifically listed as a hazardous waste in federal regulations; however it may be characteristically hazardous if it is considered toxic, corrosive, ignitable, or reactive according to federal definitions (40 CFR 261). Additionally, this material may be designated as hazardous according to state and/or local regulations.

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## SECTION 14 — TRANSPORTATION INFORMATION

### DOT – United States – Department of Transportation

Shipping Name: Sulfur, molten  
ID Number: NA2448  
Hazard Class: 9  
Packing Group: III

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## SECTION 15 — REGULATORY INFORMATION

### United States Regulations

CERCLA/SARA Section 311/312 (Title III Hazard Categories)

Acute Health: No  
Chronic Health: No  
Fire Hazard: Yes



Pressure Hazard: No  
 Reactive Hazard: No

This material may contain one or more of the following chemicals identified by the EPA under Title 40 of the Code of Federal Regulations (CFR), including the EPCRA section 302 (40 CFR Part 355), EPCRA section 304 (40 CFR Part 355), EPCRA sections 311/312 (40 CFR Part 370), EPCRA section 313 (40 CFR Part 372), CERCLA sections 102/103 (40 CFR Part 302), Clean Air Act (CAA) 111(r) (40 CFR Part 68), and/or TSCA (40 CFR 700-766).

This material may contain one or more chemicals identified on individual state hazardous substances lists. Contact each jurisdiction for more information.

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or other reproductive harm.

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## SECTION 16 – OTHER INFORMATION

### Preparation & Version Information

Version 004 – Last revision on 2015-02-27.

Prepared by Certified Environmental Management, Ltd. ([www.cemih.com](http://www.cemih.com)).

### Guide to Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
ANSI	American National Standards Institute
CAA	Clean Air Act (United States)
CAS	Chemical Abstracts Service
CEIL	Ceiling Exposure Limit
CERCLA	The Comprehensive Environmental Response, Compensation, & Liability Act (United States)
CFR	Code of Federal Regulations (United States)
EINECS	European chemical Substances Information System
EPA	Environmental Protection Agency (United States)
GHS	Globally Harmonized System
IARC	International Agency for Research on Cancer
LEL	Lower Explosive Limit
NFPA	National Fire Protection Association
NTP	National Toxicology Program (United States)
OSHA	Occupational Safety and Health Administration (United States)
PEL	Permissible Exposure Limit (OSHA)
SARA	Superfund Amendments and Reauthorization Act (United States)
TLV	Threshold Limit Value (ACGIH)
TSCA	Toxic Substances Control Act (United States)
TWA	Time Weighted Average (8 hours)
UEL	Upper Explosive Limit
UN	United Nations

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