



# MATERIAL SAFETY DATA SHEET

## 1. Product and Company Identification

**Material name** Sulfur (Liquid)  
**Version #** 01  
**Revision date** 06-02-2010  
**Product use** Industrial chemical.  
**Manufacturer/Supplier** Devon US Operations  
20 North Broadway  
Oklahoma City, OK 73102-8260  
Telephone: (405) 235-3611  
-  
Devon Canadian Operations  
Calgary, AB. T2P 4H2  
2000, 400 – 3rd Avenue SW.  
Telephone: (403) 232-7100  
**Emergency** Emergency Chemtrec:  
Within the USA (800) 424-9300  
Outside the USA (703) 527-3887  
Devon Canada Emergency Phone:  
(403) 232-7100

## 2. Hazards Identification

**Physical state** Liquid.  
**Appearance** Viscous liquid.  
**Emergency overview** CAUTION

At elevated temperatures may cause irritation of the eyes and respiratory tract. Hydrogen sulfide, a highly toxic gas, may be present or released. 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.

**OSHA regulatory status** This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

### Potential health effects

**Eyes** At elevated temperatures, vapor may cause irritation of eyes. Contact with hot material can cause thermal burns which may result in permanent damage.

**Skin** Contact with hot material can cause thermal burns which may result in permanent damage.

**Inhalation** Inhalation of vapors/fumes generated by heating this product may cause respiratory irritation with throat discomfort, coughing or difficulty breathing.

**Ingestion** Direct contact with hot material can cause thermal burns.

**Chronic effects** Vapors may be irritating and cause chest discomfort and symptoms of bronchitis.

**Signs and symptoms** Symptoms of exposure to fumes from heated material may include: Irritation of nose and throat. Coughing. Shortness of breath. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting.

**Potential environmental effects** The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

## 3. Composition / Information on Ingredients

Components	CAS #	Percent
Sulphur	7704-34-9	100

**Composition comments** \* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

## 4. First Aid Measures

### First aid procedures

<b>Eye contact</b>	If hot product contacts eye, flush with water for at least 15 minutes and seek medical attention immediately.
<b>Skin contact</b>	In case of contact with hot or molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily.
<b>Inhalation</b>	If fumes from heated product are inhaled: Move into fresh air and keep at rest. If breathing is difficult, give oxygen. Get medical attention if symptoms occur.
<b>Ingestion</b>	Not likely, due to the form of the product.
<b>Notes to physician</b>	Treat symptomatically.
<b>General advice</b>	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

## 5. Fire Fighting Measures

<b>Flammable properties</b>	The product is not flammable.
<b>Extinguishing media</b>	
<b>Suitable extinguishing media</b>	Use: Water spray. Foam. Powder. Dry sand.
<b>Protection of firefighters</b>	
<b>Protective equipment and precautions for firefighters</b>	Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.
<b>Specific methods</b>	Cool containers exposed to heat with water spray and remove container, if no risk is involved.
<b>Hazardous combustion products</b>	Sulfur oxides. Hydrogen sulfide.

## 6. Accidental Release Measures

<b>Personal precautions</b>	Avoid inhalation of fumes from molten product. Avoid contact with hot material. Keep unnecessary personnel away. Ventilate closed spaces before entering. Wear suitable protective clothing, gloves and eye/face protection. For personal protection, see section 8 of the MSDS.
<b>Environmental precautions</b>	Stop leak if possible without any risk. Contact local authorities in case of spillage to drain/aquatic environment.
<b>Methods for containment</b>	Prevent entry into waterways, sewers, basements or confined areas.
<b>Methods for cleaning up</b>	Sweep up or gather material and place in appropriate container for disposal. Heated material: Let it solidify. Contain spillage with sand or earth and remove to a safe place after it has solidified. Containers with collected spillage must be properly labeled with correct contents and hazard symbol. Collect and dispose of spillage as indicated in section 13 of the MSDS.
<b>Other information</b>	Clean up in accordance with all applicable regulations.

## 7. Handling and Storage

<b>Handling</b>	Use only with adequate ventilation. Avoid inhalation of fumes from molten product. Avoid contact with molten material. Wear personal protective equipment. Observe good industrial hygiene practices.
<b>Storage</b>	Keep container tightly closed. Keep container in a well-ventilated place. Store away from incompatible materials.

## 8. Exposure Controls / Personal Protection

### Occupational exposure limits

#### Canada - Alberta

#### Components

Sulphur (7704-34-9)

#### Type

TWA

#### Value

10 mg/m<sup>3</sup>

<b>Engineering controls</b>	Adequate ventilation should be provided whenever the material is heated or mists are generated. Observe Occupational Exposure Limits and minimize the risk of inhalation.
<b>Personal protective equipment</b>	
<b>Eye / face protection</b>	Heated material: Wear safety glasses with side shields (or goggles).
<b>Skin protection</b>	When material is heated, wear gloves to protect against thermal burns. Thermally protective, chemical resistant full body suit is recommended when volume of material is significant.

<b>Respiratory protection</b>	Wear approved respiratory protection when working with this material unless ventilation or other engineering controls are adequate to keep airborne concentrations below recommended exposure standards. Follow respirator protection program requirements (OSHA 1910.134 or CSA-Z94.4-02(R2008), and ANSI / AIHA Z88.6) for all respirator use. Note: If any of the applicable hydrogen sulfide standards are likely to be exceeded, positive pressure supplied-air respiratory protection must be used.
<b>General hygiene considerations</b>	Avoid contact with eyes. 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.

## 9. Physical & Chemical Properties

<b>Appearance</b>	Viscous liquid.
<b>Color</b>	Yellow.
<b>Odor</b>	Faint rotten egg.
<b>Odor threshold</b>	Not available.
<b>Physical state</b>	Liquid.
<b>Form</b>	Solid.
<b>pH</b>	Not available.
<b>Melting point</b>	235.4 - 251.6 °F (113 - 122 °C)
<b>Freezing point</b>	Not available.
<b>Boiling point</b>	832.3 °F (444.6 °C)
<b>Flash point</b>	370.4 - 404.6 °F (188 - 207 °C) Closed Cup
<b>Evaporation rate</b>	Not available.
<b>Flammability</b>	Not available.
<b>Flammability limits in air, upper, % by volume</b>	Not available.
<b>Flammability limits in air, lower, % by volume</b>	Not available.
<b>Vapor pressure</b>	1 mm Hg (184°C/ 363.2°F)
<b>Vapor density</b>	Not available.
<b>Specific gravity</b>	2.07 (water=1)
<b>Solubility (water)</b>	Insoluble in water.
<b>Partition coefficient (n-octanol/water)</b>	Not available.
<b>Auto-ignition temperature</b>	494.6 °F (257 °C)
<b>Decomposition temperature</b>	Not available.

## 10. Chemical Stability & Reactivity Information

<b>Chemical stability</b>	Stable at normal conditions.
<b>Conditions to avoid</b>	Moisture. Incompatible materials.
<b>Incompatible materials</b>	Strong oxidizing agents.
<b>Hazardous decomposition products</b>	Sulfur oxide. Hydrogen sulfide.
<b>Possibility of hazardous reactions</b>	Will not occur.

## 11. Toxicological Information

<b>Acute effects</b>	At elevated temperatures, vapor may cause irritation of eyes and respiratory tract. Hydrogen sulfide, a highly toxic gas, may be present. 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.
<b>Local effects</b>	Contact with hot material can cause thermal burns which may result in permanent damage. Inhalation of vapors/fumes generated by heating this product may cause respiratory irritation with throat discomfort, coughing or difficulty breathing.
<b>Sensitization</b>	Not a skin sensitizer.
<b>Chronic effects</b>	Vapors may be irritating and cause chest discomfort and symptoms of bronchitis.

<b>Epidemiology</b>	Not available.
<b>Mutagenicity</b>	Not available.
<b>Neurological effects</b>	Not available.
<b>Reproductive effects</b>	Not available.
<b>Teratogenicity</b>	Not available.
<b>Further information</b>	None known.

## 12. Ecological Information

### Ecotoxicological data

#### Components

#### Test Results

Sulphur (7704-34-9)	LC50 Western mosquitofish ( <i>Gambusia affinis</i> ): > 10000 mg/l 96 hours
---------------------	---

<b>Ecotoxicity</b>	The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.
<b>Environmental effects</b>	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
<b>Persistence and degradability</b>	No data available.
<b>Bioaccumulation / Accumulation</b>	No data available.
<b>Partition coefficient (n-octanol/water)</b>	Not available.
<b>Mobility in environmental media</b>	The product is insoluble in water.

## 13. Disposal Considerations

<b>Waste codes</b>	Not regulated.
<b>Disposal instructions</b>	Dispose of this material and its container at hazardous or special waste collection point.
<b>Waste from residues / unused products</b>	Dispose of in accordance with local regulations.
<b>Contaminated packaging</b>	Since emptied containers may retain product residue, follow label warnings even after container is emptied.

## 14. Transport Information

### DOT

#### Basic shipping requirements:

<b>UN number</b>	UN2448
<b>Proper shipping name</b>	Sulfur, molten
<b>Hazard class</b>	4.1
<b>Packing group</b>	III
<b>Environmental hazards</b>	
<b>Marine pollutant</b>	No
<b>Labels required</b>	4.1
<b>Additional information:</b>	
<b>Special provisions</b>	30, IB1, T1, TP3
<b>Packaging exceptions</b>	None
<b>Packaging non bulk</b>	213
<b>Packaging bulk</b>	247
<b>ERG number</b>	133

### IATA

#### Basic shipping requirements:

<b>UN number</b>	2448
<b>Proper shipping name</b>	Sulphur, molten
<b>Hazard class</b>	4.1

### IMDG

#### Basic shipping requirements:

<b>UN number</b>	2448
<b>Proper shipping name</b>	Sulfur, molten

<b>Hazard class</b>	4.1
<b>Packing group</b>	III
<b>Environmental hazards</b>	
<b>Marine pollutant</b>	No
<b>EmS No.</b>	F-A, S-H

**TDG**

**Basic shipping requirements:**

<b>Proper shipping name</b>	Sulfur, molten
<b>Hazard class</b>	4.1
<b>UN number</b>	UN2448
<b>Packing group</b>	III
<b>Marine pollutant</b>	No
<b>Additional information:</b>	
<b>Special provisions</b>	32



**DOT**



**IATA**



**IMDG**



**TDG**

**15. Regulatory Information**

**US federal regulations** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**CERCLA (Superfund) reportable quantity (lbs)**  
None

**Superfund Amendments and Reauthorization Act of 1986 (SARA)**

<b>Hazard categories</b>	Immediate Hazard - Yes Delayed Hazard - No Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - No
--------------------------	--

<b>Section 302 extremely hazardous substance</b>	No
--	----

<b>Section 311 hazardous chemical</b>	No
---------------------------------------	----

<b>Drug Enforcement Agency (DEA)</b>	Not controlled
--------------------------------------	----------------

<b>WHMIS status</b>	Controlled
---------------------	------------

<b>WHMIS classification</b>	B4 - Flammable/Combustible
-----------------------------	----------------------------

## WHMIS labeling



### State regulations

**US - California Hazardous Substances (Director's): Listed substance**

Sulphur (CAS 7704-34-9) Listed.

**US - Massachusetts RTK - Substance: Listed substance**

Sulphur (CAS 7704-34-9) Listed.

**US - New Jersey RTK - Substances: Listed substance**

Sulphur (CAS 7704-34-9) Listed.

**US - Pennsylvania RTK - Hazardous Substances: Listed substance**

Sulphur (CAS 7704-34-9) Listed.

## 16. Other Information

### Further information

HMIS® is a registered trade and service mark of the NPCA. G - Safety Glasses, Gloves, Vapor Respirator

### HMIS® ratings

Health: 2  
Flammability: 1  
Physical hazard: 0  
Personal protection: X

### NFPA ratings

Health: 2  
Flammability: 1  
Instability: 0

### Disclaimer

This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.

### Issue date

06-02-2010