

# MATERIAL SAFETY DATA SHEET

## 1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology  
Standard Reference Materials Program  
100 Bureau Drive, Stop 2300  
Gaithersburg, Maryland 20899-2300

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RM Number: 8553  
MSDS Number: 8553  
RM Name: IAEA-S-4 (Soufre de Lacq)  
(Sulfur Isotopes in Elemental Sulfur)

Date of Issue: 04 January 2012

Emergency Telephone ChemTrec:  
1-800-424-9300 (North America)  
+1-703-527-3887 (International)

**Description:** A unit of Reference Material (RM) 8553 consists of 0.50 g of powdered elemental sulfur.

**Substance:** Sulfur.

**Other Designations:** Sulfur (Brimstone, flowers of sulfur, sublimed sulfur, sulphur).

## 2. HAZARDS IDENTIFICATION

**NFPA Ratings (Scale 0–4):** Health = 3      Fire = 1      Reactivity = 0

**Physical Hazards:** Slight fire hazard; dust/air mixtures may ignite; may ignite if heated.

**Major Health Hazards:** Sulfur is classified as an irritant.

### Potential Health Effects

**Inhalation:** Short-term (acute) exposure to sulfur dust may irritate the respiratory tract, and result in coughing, difficulty breathing, and death. Long-term (chronic) exposure may result in respiratory tract irritation, asthma, lung damage.

**Skin Contact:** Skin contact may result in irritation. Repeated exposure result in dermatitis or skin lesions.

**Eye Contact:** Direct contact may cause irritation with redness and pain. Chronic exposure may result in conjunctivitis.

**Ingestion:** No information listed for acute for chronic exposure.

### Listed as a Carcinogen/Potential Carcinogen:

	<u>Yes</u>	<u>No</u>
In the National Toxicology Program (NTP) Report on Carcinogens	_____	<u>X</u>
In the International Agency for Research on Cancer (IARC) Monographs	_____	<u>X</u>
By the Occupational Safety and Health Administration (OSHA)	_____	<u>X</u>

## 3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Components	CAS Number	EC Number (EINECS)	Nominal Concentration (mass fraction)
Sulfur	7704-34-9	231-722-6	100 %

**EC Classification (assigned):** Xi

**EC Risk (R):** R38

**EC Safety (S):** S46

**EC Risk/Safety Phrases:** See Section 15, "Regulatory Information".

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#### 4. FIRST AID MEASURES

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**Inhalation:** If adverse effects occur, remove to uncontaminated area. Seek medical attention if needed.

**Skin Contact:** Wash exposed skin with copious amounts of water for at least 15 minutes. Remove any contaminated clothing.

**Eye Contact:** Immediately flush eyes with copious amounts of water for at least 15 minutes. Seek immediate medical attention.

**Ingestion:** Ingestion of this material is not likely under normal conditions. If swallowed, contact local poison control or seek medical attention.

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#### 5. FIRE FIGHTING MEASURES

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**Fire and Explosion Hazards:** Slight fire and explosion hazard. Dust/air mixtures may ignite or explode.

**Extinguishing Media:** Use extinguishing agents appropriate for the surrounding fire.

**Fire Fighting:** Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

**Flash Point (°C):** Not applicable.

**Method Used:** Not applicable.

**Autoignition Temp. (°C):** Not applicable.

**Flammability Limits in Air**

**Upper (Volume %):** 1400 g/m<sup>3</sup>.

**Lower (Volume %):** 35 g/m<sup>3</sup>.

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#### 6. ACCIDENTAL RELEASE MEASURES

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**Occupational Release:** Avoid generating dust. Collect spilled material and place in an appropriate container for disposal.

**Disposal:** Refer to Section 13, "Disposal Considerations".

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#### 7. HANDLING AND STORAGE

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**Storage:** Store and handle in accordance with all current regulations and standards.

**Safe Handling Precautions:** See Section 8, "Exposure Controls and Personal Protection".

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#### 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

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**Exposure Limits:** No exposure limits have been developed.

**Ventilation:** Use a local exhaust ventilation system.

**Respirator:** If workplace conditions warrant a respirator, a respiratory protection plan that meets OSHA 29 CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

**Eye Protection:** Wear safety goggles. An eyewash station should be readily available near areas of use.

**Personal Protection:** Wear appropriate protective clothing and gloves to prevent skin exposure.

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#### 9. PHYSICAL AND CHEMICAL PROPERTIES

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**Component:** Sulfur, powder

**Physical State:** Solid

**Appearance and Odor:** Fine yellow powder; odorless.

**Molecular Formula:** S

**Molar mass (g/mol):** 32.07

**Density:** Not applicable.

**Water Solubility:** Insoluble.

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## 10. STABILITY AND REACTIVITY

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**Stability:**          X   Stable                                       Unstable

**Conditions to Avoid:** Avoid generating dust.

**Incompatible Materials:** Metal salts, metals, bases, halogens, oxidizers, reducing agents.

**Fire/Explosion Information:** See Section 5, "Fire Fighting Measures".

**Hazardous Decomposition:** Oxides of sulfur.

**Hazardous Polymerization:**               Will Occur                                  X   Will Not Occur

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## 11. TOXICOLOGICAL INFORMATION

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**Route of Entry:**          X   Inhalation                                  X   Skin                                  X   Ingestion

**Toxicity Data:**

Rat, Oral LD<sub>50</sub>: >3000 mg/kg.

Rat, Inhalation LC<sub>50</sub>: >9.23 mg/L, 4 hours.

**Target Organs:** Respiratory tract, eyes, skin.

**Medical Conditions Aggravated by Exposure:** Eye disorders, skin disorders, respiratory disorders, allergies, immune system.

**Mutagen:** No data listed.

**Reproductive effects:** No data listed.

**Health Effects (Acute and Chronic):** See Section 3, "Hazards Identification" for potential health effects.

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## 12. ECOLOGICAL INFORMATION

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**Ecotoxicity Data:**

**Fish:** Blue gill (*Lepomis macrochirus*) LC<sub>50</sub> 14 mg/L static 96 h.

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## 13. DISPOSAL CONSIDERATIONS

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**Waste Disposal:** Dispose in accordance with all applicable federal, state, and local regulations.

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## 14. TRANSPORTATION INFORMATION

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**U.S. DOT and IATA:** Sulphur, UN1350, 4.1, Packing Group III, Excepted Quantity E1.

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## 15. REGULATORY INFORMATION

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**U.S.: REGULATIONS**

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Sections 302 (40 CFR 355.30): Not regulated.

SARA Title III Sections 304 (40 CFR 355.40): Not regulated.

SARA Title III Sections 313 (40 CFR 372.65): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE:            Yes

CHRONIC:        No

FIRE:             No

REACTIVE:      No

PRESSURE:      No

**STATE REGULATIONS:**

**California Proposition 65:** Not listed

**CANADIAN REGULATIONS:**

WHMIS Information: Not provided for this material.

**EUROPEAN REGULATIONS**

**EC Classification:** Xi, Skin Irrit. 2

**EC Risk Phrases:**

R38 – Irritating to skin.

**EC Safety Phrases:**

S46 – If swallowed, seek medical advice immediately and show this container or label.

**NATIONAL INVENTORY STATUS:**

**U.S. Inventory (TSCA):** Listed on inventory.

**TSCA 12 (b) Export Notification:** Not listed.

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**16. OTHER INFORMATION**

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**Sources:** ChemADVISOR, Inc., MSDS, *Sulfur*, 16 September 2011.

EC; European Chemical Substance Information System (ESIS), *Sulfur*, CAS No.7704-34-9; available at <http://esis.jrc.ec.europa.eu> (accessed Dec 2011).

**Disclaimer:** Physical and chemical data contained in this MSDS are provided only for use in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The reference values for this material are given in the NIST Report of Investigation.