1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name: Sulfur
Product Number: 213292
Brand: Aldrich
Index-No.: 016-094-00-1
CAS-No.: 7704-34-9

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses: Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company: Sigma-Aldrich Inc.
3050 Spruce Street
ST. LOUIS MO 63103
UNITED STATES
Telephone: +1 314 771-5765
Fax: +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone #: +1-703-527-3887

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Skin irritation (Category 2), H315

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word: Warning
Hazard statement(s)
H315: Causes skin irritation.
Precautionary statement(s)
P264: Wash skin thoroughly after handling.
P280: Wear protective gloves.
P302 + P352: IF ON SKIN: Wash with plenty of soap and water.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P362: Take off contaminated clothing and wash before reuse.
2.3 **Hazards not otherwise classified (HNOC) or not covered by GHS**
Combustible dust

3. **COMPOSITION/INFORMATION ON INGREDIENTS**

3.1 **Substances**

**Synonyms**: sulfur (Aerosol)

**Formula**: S

**Molecular weight**: 32.07 g/mol

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

**EC-No.**: 231-722-6

**Index-No.**: 016-094-00-1

**Hazardous components**

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfur</td>
<td>Skin Irrit. 2; H315</td>
<td>&lt;= 100 %</td>
</tr>
</tbody>
</table>

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. **FIRST AID MEASURES**

4.1 **Description of first aid measures**

**General advice**
Consult a physician. Show this safety data sheet to the doctor in attendance.

**If inhaled**
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**In case of skin contact**
Wash off with soap and plenty of water. Consult a physician.

**In case of eye contact**
Flush eyes with water as a precaution.

**If swallowed**
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 **Most important symptoms and effects, both acute and delayed**
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 **Indication of any immediate medical attention and special treatment needed**
No data available

5. **FIREFIGHTING MEASURES**

5.1 **Extinguishing media**

**Suitable extinguishing media**
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 **Special hazards arising from the substance or mixture**

**Sulphur oxides**

5.3 **Advice for firefighters**

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 **Further information**

No data available
6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Avoid breathing dust.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation ofcombustion should be taken into consideration before additional processing
Provide appropriate exhaust ventilation at places where dust is formed.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place.

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls
Appropriate engineering controls
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

Personal protective equipment

Eye/face protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested:Dermatril® (KCL 740 / Aldrich Z677272, Size M)

data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an
industry situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

**Body Protection**
Impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Respiratory protection**
For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particulate filter or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Control of environmental exposure**
Do not let product enter drains.

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### 9. PHYSICAL AND CHEMICAL PROPERTIES

#### 9.1 Information on basic physical and chemical properties

- **a) Appearance**
  - Form: flakes
  - Colour: light yellow

- **b) Odour**
  - slight

- **c) Odour Threshold**
  - No data available

- **d) pH**
  - No data available

- **e) Melting point/freezing point**
  - Melting point/range: 118 - 120 °C (244 - 248 °F)

- **f) Initial boiling point and boiling range**
  - 444.7 °C (832.5 °F)

- **g) Flash point**
  - 207 °C (405 °F) - closed cup

- **h) Evaporation rate**
  - No data available

- **i) Flammability (solid, gas)**
  - May form combustible dust concentrations in air.

- **j) Upper/lower flammability or explosive limits**
  - Upper explosion limit: 6.83 % (V)
  - Lower explosion limit: 0.17 % (V)

- **k) Vapour pressure**
  - 10 hPa at 246 °C (475 °F)
  - 1 hPa at 183.8 °C (362.8 °F)

- **l) Vapour density**
  - No data available

- **m) Relative density**
  - 2.07 g/mL at 25 °C (77 °F)

- **n) Water solubility**
  - insoluble

- **o) Partition coefficient: n-octanol/water**
  - No data available

- **p) Auto-ignition temperature**
  - 240 °C (464 °F)

- **q) Decomposition temperature**
  - No data available

- **r) Viscosity**
  - 8 mm²/s at 140 °C (284 °F)

- **s) Explosive properties**
  - No data available

- **t) Oxidizing properties**
  - No data available

#### 9.2 Other safety information

No data available
10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available

10.2 Chemical stability
Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
No data available

10.4 Conditions to avoid
Avoid moisture. Heat, flames and sparks.

10.5 Incompatible materials
Strong oxidizing agents: Amines, Bases

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Sulphur oxides
Other decomposition products - No data available
In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity
LDLO Oral - Rabbit - 175 mg/kg(Sulfur)
LD50 Oral - Rat - > 2,000 mg/kg(Sulfur)
LC50 Inhalation - Rat - 4 h - > 9.23 mg/l(Sulfur)
LD50 Dermal - Rabbit - > 2,000 mg/kg(Sulfur)
LDLO Intravenous - Rat - 8 mg/kg(Sulfur)
LDLO Intravenous - Rabbit - 5 mg/kg(Sulfur)
LDLO Intraperitoneal - Guinea pig - 55 mg/kg(Sulfur)
LDLO Intravenous - Dog - 10 mg/kg(Sulfur)

Skin corrosion/irritation
Skin - Rabbit(Sulfur)
Result: Moderate skin irritation
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Eyes - Rabbit(Sulfur)
Result: No eye irritation

Respiratory or skin sensitisation
No data available(Sulfur)

Germ cell mutagenicity
No data available(Sulfur)

Carcinogenicity
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

No component of this product present at levels greater than or equal to 0.1% is identified as a
known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available (Sulfur)

No data available (Sulfur)

Specific target organ toxicity - single exposure
No data available (Sulfur)

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available (Sulfur)

Additional Information
RTECS: WS4250000

Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting, dermatitis (Sulfur)

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated (Sulfur)

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Toxicity to fish
LC50 - Oncorhynchus mykiss (rainbow trout) - > 180 mg/l - 96 h (Sulfur)

LC50 - other fish - 866 mg/l - 96 h (Sulfur)

Toxicity to daphnia and other aquatic invertebrates
EC50 - Daphnia magna (Water flea) - > 5,000 mg/l - 48 h (Sulfur)

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available (Sulfur)

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects
No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Offer surplus and non-recyclable solutions to a licensed disposal company.

Contaminated packaging
Dispose of as unused product.
14. TRANSPORT INFORMATION

DOT (US)
NA-Number: 1350   Class: 9   Packing group: III
Proper shipping name: Sulfur
Poison Inhalation Hazard: No

IMDG
UN number: 1350   Class: 4.1   Packing group: III
Proper shipping name: SULPHUR
EMS-No: F-A, S-G

IATA
UN number: 1350   Class: 4.1   Packing group: III
Proper shipping name: Sulfur

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Massachusetts Right To Know Components

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Pennsylvania Right To Know Components

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New Jersey Right To Know Components

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California Prop. 65 Components

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

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

H315   Causes skin irritation.

HMIS Rating
Health hazard: 2
Chronic Health Hazard: 2
Flammability: 2
Physical Hazard 2

NFPA Rating
Health hazard: 2
Fire Hazard: 1
Reactivity Hazard: 2
Further information
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Preparation Information
Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 6.1 Revision Date: 05/28/2017 Print Date: 06/28/2019