

## SAFETY DATA SHEET

Version 4.8  
Revision Date 05/27/2016  
Print Date 05/15/2018

### 1. PRODUCT AND COMPANY IDENTIFICATION

#### 1.1 Product identifiers

Product name : Manganese(IV) oxide

Product Number : 529664

Brand : Aldrich

Index-No. : 025-001-00-3

CAS-No. : 1313-13-9

#### 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  
3050 Spruce Street  
SAINT LOUIS MO 63103  
USA

Telephone : +1 800-325-5832

Fax : +1 800-325-5052

#### 1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887 (CHEMTREC)

### 2. HAZARDS IDENTIFICATION

#### 2.1 Classification of the substance or mixture

##### GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Acute toxicity, Oral (Category 4), H302

Acute toxicity, Inhalation (Category 4), H332

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)

H302 + H332

Harmful if swallowed or if inhaled

Precautionary statement(s)

P261

Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.

P264

Wash skin thoroughly after handling.

P270

Do not eat, drink or smoke when using this product.

P271

Use only outdoors or in a well-ventilated area.

P301 + P312 + P330

IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.

Rinse mouth.

P304 + P340 + P312

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/ physician if you feel unwell.

**2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none**

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**3. COMPOSITION/INFORMATION ON INGREDIENTS****3.1 Substances**

Synonyms : Manganese dioxide

Formula : MnO<sub>2</sub>

Molecular weight : 86.94 g/mol

CAS-No. : 1313-13-9

EC-No. : 215-202-6

Index-No. : 025-001-00-3

**Hazardous components**

| Component                | Classification            | Concentration |
|--------------------------|---------------------------|---------------|
| <b>Manganese dioxide</b> |                           |               |
|                          | Acute Tox. 4; H302 + H332 | <= 100 %      |

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

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**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. Move out of dangerous area.

**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

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**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**

No data available

**5.3 Advice for firefighters**

Wear self-contained breathing apparatus for firefighting if necessary.

**5.4 Further information**

No data available

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## 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.

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## 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 of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs.  
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.

Keep in a dry place.

Storage class (TRGS 510): Non Combustible Solids

### 7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 Control parameters

#### Components with workplace control parameters

| Component         | CAS-No.   | Value                                                                                                                                                                           | Control parameters | Basis                                                                            |
|-------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------------------------------------------|
| Manganese dioxide | 1313-13-9 | C                                                                                                                                                                               | 5.000000 mg/m3     | USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants |
|                   | Remarks   | Ceiling limit is to be determined from breathing-zone air samples.                                                                                                              |                    |                                                                                  |
|                   |           | TWA                                                                                                                                                                             | 0.200000 mg/m3     | USA. ACGIH Threshold Limit Values (TLV)                                          |
|                   |           | Central Nervous System impairment<br>Adopted values or notations enclosed are those for which changes are proposed in the NIC<br>See Notice of Intended Changes (NIC)<br>varies |                    |                                                                                  |
|                   |           | TWA                                                                                                                                                                             | 1.000000 mg/m3     | USA. NIOSH Recommended Exposure Limits                                           |
|                   |           | ST                                                                                                                                                                              | 3.000000 mg/m3     | USA. NIOSH Recommended Exposure Limits                                           |
|                   |           | TWA                                                                                                                                                                             | 0.100000 mg/m3     | USA. ACGIH Threshold Limit Values (TLV)                                          |
|                   |           | Central Nervous System impairment<br>2015 Adoption<br>varies                                                                                                                    |                    |                                                                                  |

|  |  |                                                                                       |                |                                                                                         |
|--|--|---------------------------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------|
|  |  | TWA                                                                                   | 0.020000 mg/m3 | USA. ACGIH Threshold Limit Values (TLV)                                                 |
|  |  | Central Nervous System impairment<br>2015 Adoption<br>varies                          |                |                                                                                         |
|  |  | C                                                                                     | 5 mg/m3        | USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants        |
|  |  | Ceiling limit is to be determined from breathing-zone air samples.                    |                |                                                                                         |
|  |  | TWA                                                                                   | 0.1 mg/m3      | USA. ACGIH Threshold Limit Values (TLV)                                                 |
|  |  | Central Nervous System impairment<br>Not classifiable as a human carcinogen<br>varies |                |                                                                                         |
|  |  | TWA                                                                                   | 0.02 mg/m3     | USA. ACGIH Threshold Limit Values (TLV)                                                 |
|  |  | Central Nervous System impairment<br>Not classifiable as a human carcinogen<br>varies |                |                                                                                         |
|  |  | TWA                                                                                   | 1 mg/m3        | USA. NIOSH Recommended Exposure Limits                                                  |
|  |  | ST                                                                                    | 3 mg/m3        | USA. NIOSH Recommended Exposure Limits                                                  |
|  |  | PEL                                                                                   | 0.2 mg/m3      | California permissible exposure limits for chemical contaminants (Title 8, Article 107) |

## 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

#### Eyeface 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: Dermatrill® (KCL 740 / Aldrich Z677272, Size M)

#### Splash contact

Material: Nitrile rubber

Minimum layer thickness: 0.11 mm

Break through time: 480 min

Material tested: Dermatrill® (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 industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

**Body Protection**

Complete suit protecting against chemicals, 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) particle respirator. For higher level protection use type OV/AG/P99 (US) 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: powder                                |
| b) Odour                                        | No data available                           |
| c) Odour Threshold                              | No data available                           |
| d) pH                                           | No data available                           |
| e) Melting point/freezing point                 | Melting point/range: 535 °C (995 °F) - dec. |
| f) Initial boiling point and boiling range      | No data available                           |
| g) Flash point                                  | No data available                           |
| h) Evaporation rate                             | No data available                           |
| i) Flammability (solid, gas)                    | No data available                           |
| j) Upper/lower flammability or explosive limits | No data available                           |
| k) Vapour pressure                              | No data available                           |
| l) Vapour density                               | No data available                           |
| m) Relative density                             | 5.026 g/cm <sup>3</sup>                     |
| n) Water solubility                             | No data available                           |
| o) Partition coefficient: n-octanol/water       | No data available                           |
| p) Auto-ignition temperature                    | No data available                           |
| q) Decomposition temperature                    | No data available                           |
| r) Viscosity                                    | No data available                           |
| s) Explosive properties                         | No data available                           |
| t) Oxidizing properties                         | No data available                           |

**9.2 Other safety information**

No data available

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**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

No data available

### 10.5 Incompatible materials

Strong acids, Strong reducing agents, Organic materials

### 10.6 Hazardous decomposition products

Hazardous decomposition products formed under fire conditions. - Manganese/manganese oxides

Other decomposition products - No data available

In the event of fire: see section 5

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## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

#### Acute toxicity

No data available

Inhalation: No data available

Dermal: No data available

No data available

#### Skin corrosion/irritation

No data available

#### Serious eye damage/eye irritation

No data available

#### Respiratory or skin sensitisation

No data available

#### Germ cell mutagenicity

No data available

#### 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.

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.

#### Reproductive toxicity

No data available

No data available

#### Specific target organ toxicity - single exposure

No data available

#### Specific target organ toxicity - repeated exposure

No data available

#### Aspiration hazard

No data available

#### Additional Information

RTECS: OP0350000

Men exposed to manganese dusts showed a decrease in fertility. Chronic manganese poisoning primarily involves the central nervous system. Early symptoms include languor, sleepiness and weakness in the legs. A stolid mask-like appearance of the face, emotional disturbances such as uncontrollable laughter and a spastic gait with tendency to fall in walking are findings in more advanced cases. High incidence of pneumonia has been found in workers exposed to the dust or fume of some manganese compounds.

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

Liver - Irregularities - Based on Human Evidence

Liver - Irregularities - Based on Human Evidence

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## 12. ECOLOGICAL INFORMATION

### 12.1 Toxicity

No data available

### 12.2 Persistence and degradability

No data available

### 12.3 Bioaccumulative potential

No data available

### 12.4 Mobility in soil

No data available

### 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

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## 13. DISPOSAL CONSIDERATIONS

### 13.1 Waste treatment methods

#### Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

#### Contaminated packaging

Dispose of as unused product.

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## 14. TRANSPORT INFORMATION

### DOT (US)

Not dangerous goods

### IMDG

Not dangerous goods

### IATA

Not dangerous goods

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## 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

The following components are subject to reporting levels established by SARA Title III, Section 313:

|                   | CAS-No.   | Revision Date |
|-------------------|-----------|---------------|
| Manganese dioxide | 1313-13-9 | 2007-07-01    |

### SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

### Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

### Pennsylvania Right To Know Components

|                   | CAS-No.   | Revision Date |
|-------------------|-----------|---------------|
| Manganese dioxide | 1313-13-9 | 2007-07-01    |

## New Jersey Right To Know Components

Manganese dioxide

CAS-No.  
1313-13-9

Revision Date  
2007-07-01

## 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.

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## 16. OTHER INFORMATION

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

|             |                                    |
|-------------|------------------------------------|
| Acute Tox.  | Acute toxicity                     |
| H302        | Harmful if swallowed.              |
| H302 + H332 | Harmful if swallowed or if inhaled |
| H332        | Harmful if inhaled.                |

### HMIS Rating

|                        |   |
|------------------------|---|
| Health hazard:         | 2 |
| Chronic Health Hazard: | * |
| Flammability:          | 0 |
| Physical Hazard        | 0 |

### NFPA Rating

|                    |   |
|--------------------|---|
| Health hazard:     | 2 |
| Fire Hazard:       | 0 |
| Reactivity Hazard: | 0 |

### Further information

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### Preparation Information

Sigma-Aldrich Corporation  
Product Safety – Americas Region  
1-800-521-8956

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