

# Safety Data Sheet (SDS)

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## Reactive Manganese Oxide (MnO) for Chemical Synthesis Use

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Revision Date: 2026-03-19

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### Section 1: Identification

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#### 1.1 Product Identifier

- **Product Name:** Reactive Manganese Oxide (MnO) for Chemical Synthesis Use
- **Chemical Name:** Manganese(II) Oxide
- **Synonyms:** Manganous Oxide, Manganese Monoxide
- **Chemical Formula:** MnO
- **CAS No.:** 1344-43-0
- **EC No.:** 215-695-8

#### 1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

- **Identified Uses:** Chemical synthesis (inorganic and organic reaction systems), catalyst preparation, ceramic materials (color control and phase stability), metallurgical intermediates, battery material research.
- **Uses Advised Against:** Not for human consumption. Industrial use only.

#### 1.3 Details of the Supplier of the Safety Data Sheet

- **Company Name:** BTLnewmaterial
- **Address:** Room 706, No. 154, Wuyi East Road, Niezhou Residential Committee, Caizichi Sub-district Office, Leiyang City, Hengyang City, Hunan Province, China
- **Email:** lixifirm@outlook.com

- **Phone/WhatsApp:** +8618273793022
- **Website:** [manganesesupply.com](http://manganesesupply.com)

#### 1.4 Emergency Telephone Number

- +8618273793022 (During business hours)
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## Section 2: Hazard(s) Identification

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### 2.1 Classification of the Substance or Mixture

According to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), Manganese(II) Oxide is generally **not classified as a dangerous substance** for human health or the environment under normal conditions of use by some authorities [1]. However, other classifications exist, including:

- **Specific Target Organ Toxicity - Repeated Exposure, Category 2** (Central Nervous System) [2]
- **Hazardous to the Aquatic Environment - Chronic Hazard, Category 3** [3]

### 2.2 GHS Label Elements

- **Hazard Pictogram(s):** GHS08 (Health Hazard) - *if classified for STOT-RE*
- **Signal Word:** Warning - *if classified for STOT-RE*
- **Hazard Statements:**
  - H373: May cause damage to organs (Central Nervous System) through prolonged or repeated exposure (if inhaled) [2]
  - H412: Harmful to aquatic life with long lasting effects [3]
- **Precautionary Statements:**
  - P260: Do not breathe dust/fume/gas/mist/vapours/spray.
  - P273: Avoid release to the environment.
  - P314: Get medical advice/attention if you feel unwell.
  - P501: Dispose of contents/container in accordance with local/regional/national/international regulations.

### 2.3 Other Hazards Which Do Not Result in GHS Classification

- Dust may cause mechanical irritation to eyes and respiratory tract.
  - Manganese dusts can be flammable under certain conditions [4].
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## Section 3: Composition/Information on Ingredients

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### 3.1 Substances

Chemical Identity	Common Name	CAS No.	EC No.	Concentration (%)
Manganese(II) Oxide	Manganese Oxide	1344-43-0	215-695-8	≥ 90-95

**Impurities:** Arsenic (As) ≤ 5 ppm, Lead (Pb) ≤ 10 ppm, Cadmium (Cd) ≤ 5 ppm. Other trace impurities may be present.

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## Section 4: First-Aid Measures

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### 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 if irritation develops.
- **In Case of Eye Contact:** Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
- **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

- **Acute:** May cause irritation to eyes, skin, and respiratory tract. Ingestion may cause gastrointestinal upset.

- **Delayed:** Prolonged or repeated inhalation of manganese dusts may lead to neurological disorders (manganism) characterized by psychiatric symptoms, motor disturbances, and cognitive impairment [2].

#### 4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

- Treat symptomatically. For severe exposures, medical observation and treatment may be required.
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## Section 5: Fire-Fighting Measures

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### 5.1 Extinguishing Media

- **Suitable Extinguishing Media:** Use water spray, alcohol-resistant foam, dry chemical, or carbon dioxide. For metal fires, use sand or dry chemicals appropriate for extinguishing metal fires [4].
- **Unsuitable Extinguishing Media:** No data available.

### 5.2 Specific Hazards Arising from the Substance or Mixture

- Not considered to be a fire hazard under normal conditions. However, manganese powder and dust are FLAMMABLE and DANGEROUS FIRE HAZARDS [4]. In a fire, may produce irritating or toxic fumes (e.g., manganese oxides).

### 5.3 Advice for Firefighters

- Wear self-contained breathing apparatus for firefighting if necessary. Use personal protective equipment.
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## Section 6: Accidental Release Measures

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### 6.1 Personal Precautions, Protective Equipment and Emergency Procedures

- Avoid dust formation. Avoid breathing vapors, mist, or gas. Ensure adequate ventilation. Use personal protective equipment (refer to Section 8).

### 6.2 Environmental Precautions

- Do not let product enter drains. Avoid discharge into the environment. Prevent further leakage or spillage if safe to do so.

### 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.
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## Section 7: Handling and Storage

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### 7.1 Precautions for Safe Handling

- Avoid contact with skin and eyes. Avoid inhalation of dust. 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

- Store in a cool, dry place. Keep container tightly closed in a well-ventilated place. Store away from strong acids and strong oxidizing agents.
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## Section 8: Exposure Controls/Personal Protection

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### 8.1 Control Parameters

- **Occupational Exposure Limits (OELs):**
  - **Manganese (as Mn, respirable fraction):** 0.02 mg/m<sup>3</sup> (ACGIH TLV, TWA); 0.1 mg/m<sup>3</sup> (OSHA PEL, Ceiling) [5]
  - **Manganese (as Mn, total dust):** 0.2 mg/m<sup>3</sup> (ACGIH TLV, TWA); 5 mg/m<sup>3</sup> (OSHA PEL, Ceiling) [5]

### 8.2 Exposure Controls

- **Engineering Controls:** Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of the workday. Use local exhaust ventilation to keep airborne concentrations below the recommended exposure limits.

- **Personal Protective Equipment (PPE):**
    - **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. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.
    - **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) 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).
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## Section 9: Physical and Chemical Properties

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### 9.1 Information on Basic Physical and Chemical Properties

<b>Property</b>	<b>Value</b>
<b>Appearance</b>	Greenish powder
<b>Odor</b>	Odorless
<b>Odor Threshold</b>	Not applicable
<b>pH</b>	Not available
<b>Melting Point/Freezing Point</b>	1780 °C (approx.)
<b>Initial Boiling Point and Range</b>	Not applicable
<b>Flash Point</b>	Not applicable
<b>Evaporation Rate</b>	Not applicable
<b>Flammability (solid, gas)</b>	Non-flammable (dust may be flammable)
<b>Upper/Lower Flammability Limit</b>	Not applicable
<b>Vapor Pressure</b>	Not applicable
<b>Vapor Density</b>	Not applicable
<b>Relative Density</b>	5.18 g/cm <sup>3</sup> (approx.)
<b>Bulk Density</b>	1.0–1.5 g/cm <sup>3</sup>
<b>Solubility(ies)</b>	Insoluble in water, soluble in acids
<b>Partition Coefficient</b>	Not available
<b>Auto-Ignition Temperature</b>	Not applicable
<b>Decomposition Temperature</b>	Not available
<b>Viscosity</b>	Not applicable (solid)
<b>Explosive Properties</b>	Not explosive
<b>Oxidizing Properties</b>	Not oxidizing
<b>Particle Size</b>	80–200 mesh
<b>Solubility in 2% Citric Acid</b>	≥ 85–90%

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## Section 10: Stability and Reactivity

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### 10.1 Reactivity

- No dangerous reaction known under conditions of normal use.

### 10.2 Chemical Stability

- Stable under recommended storage conditions.

### 10.3 Possibility of Hazardous Reactions

- No hazardous reactions known.

### 10.4 Conditions to Avoid

- Exposure to strong acids, high temperatures, dust generation.

### 10.5 Incompatible Materials

- Strong acids, strong oxidizing agents.

### 10.6 Hazardous Decomposition Products

- Under fire conditions: Manganese oxides. Other decomposition products not identified.
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## Section 11: Toxicological Information

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### 11.1 Information on Toxicological Effects

- **Acute Toxicity:**
  - LD50 Oral - Rat: > 2,000 mg/kg (Manganese(II) Oxide) [6]
  - LC50 Inhalation - Rat: No data available
  - LD50 Dermal - Rabbit: No data available
- **Skin Corrosion/Irritation:** May cause mild irritation.
- **Serious Eye Damage/Irritation:** May cause mild irritation.



- **Respiratory or Skin Sensitization:** No data available.
  - **Germ Cell Mutagenicity:** No data available.
  - **Carcinogenicity:** Not classified as a carcinogen by IARC, ACGIH, NTP, or OSHA.
  - **Reproductive Toxicity:** No data available.
  - **STOT-Single Exposure:** No data available.
  - **STOT-Repeated Exposure:** Prolonged or repeated inhalation of manganese dusts may cause central nervous system effects (manganism) [2].
  - **Aspiration Hazard:** Not considered an aspiration hazard.
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## Section 12: Ecological Information

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### 12.1 Toxicity

- **Acute Aquatic Toxicity:** No data available.
- **Chronic Aquatic Toxicity:** Category 3 (Harmful to aquatic life with long lasting effects) [3].
  - LC50 Fish: No data available
  - EC50 Daphnia: No data available
  - EC50 Algae: No data available

### 12.2 Persistence and Degradability

- Manganese(II) Oxide is an inorganic compound and is not expected to be readily biodegradable. It can undergo chemical transformations in the environment.

### 12.3 Bioaccumulative Potential

- Manganese is an essential trace element, but excessive levels can accumulate in organisms. Bioaccumulation potential of MnO is generally low in its insoluble form.

### 12.4 Mobility in Soil

- Insoluble in water, therefore low mobility in soil. However, under acidic conditions, it can become more soluble and mobile.

## 12.5 Other Adverse Effects

- No other adverse environmental effects are expected.
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# Section 13: Disposal Considerations

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## 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. Dispose of in accordance with local, regional, national, and international regulations.
  - **Contaminated Packaging:** Dispose of as unused product.
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# Section 14: Transport Information

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## 14.1 UN Number

- Not regulated as a hazardous material for transport.

## 14.2 UN Proper Shipping Name

- Not applicable.

## 14.3 Transport Hazard Class(es)

- Not applicable.

## 14.4 Packing Group

- Not applicable.

## 14.5 Environmental Hazards

- Not a marine pollutant.

## 14.6 Special Precautions for User

- No special precautions required.

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## Section 15: Regulatory Information

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### 15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture

- **USA:** OSHA Hazard Communication Standard (29 CFR 1910.1200). SARA 313 (TRI reporting) - Manganese compounds are subject to reporting requirements.
  - **EU:** Classification according to Regulation (EC) No 1272/2008 (CLP).
  - **China:** Relevant national regulations for chemical safety and environmental protection.
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## Section 16: Other Information

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### 16.1 Date of Preparation or Last Revision

- **Date of Preparation:** 2026-03-19
- **Version:** 1.0

### 16.2 Key to Abbreviations and Acronyms Used in the SDS

- **ACGIH:** American Conference of Governmental Industrial Hygienists
- **CAS:** Chemical Abstracts Service
- **CLP:** Classification, Labelling and Packaging (EU Regulation)
- **EC No.:** European Community Number
- **GHS:** Globally Harmonized System of Classification and Labelling of Chemicals
- **IARC:** International Agency for Research on Cancer
- **LD50:** Lethal Dose, 50%
- **LC50:** Lethal Concentration, 50%
- **MSDS/SDS:** Material Safety Data Sheet / Safety Data Sheet
- **NIOSH:** National Institute for Occupational Safety and Health
- **NTP:** National Toxicology Program

- **OEL:** Occupational Exposure Limit
- **OSHA:** Occupational Safety and Health Administration
- **PEL:** Permissible Exposure Limit
- **PPE:** Personal Protective Equipment
- **STOT:** Specific Target Organ Toxicity
- **TWA:** Time-Weighted Average
- **UN:** United Nations

### 16.3 References

[1] Carl Roth. (n.d.). *Safety Data Sheet: Manganese oxide*. Retrieved from <https://www.carlroth.com/medias/SDB-1L4X-IE-EN.pdf> [2] Sigma-Aldrich. (2025, November 6). *SAFETY DATA SHEET: Manganese(IV) oxide*. Retrieved from <https://www.sigmaaldrich.com/US/en/sds/aldrich/529664> [3] Valudor. (n.d.). *Safety Data Sheet: Manganese Oxide 60%*. Retrieved from <https://www.valudor.com/wp-content/uploads/2024/04/Manganese-Oxide-60.pdf> [4] New Jersey Department of Health. (n.d.). *Hazardous Substance Fact Sheet: Manganese*. Retrieved from <https://nj.gov/health/eoh/rtkweb/documents/fs/1155.pdf> [5] OSHA. (2023, June 14). *MANGANESE, COMPOUNDS & FUME (as Mn)*. Retrieved from <http://www.osha.gov/chemicaldata/501> [6] Thermo Fisher Scientific. (2025, September 14). *Safety Data Sheet: Manganese(II) oxide*. Retrieved from [https://assets.thermofisher.com/DirectWebViewer/private/document.aspx?prd=ALFAA44441PDFMTRCGV4EN2025-09-13%2022:41:48Manganese\(II\)](https://assets.thermofisher.com/DirectWebViewer/private/document.aspx?prd=ALFAA44441PDFMTRCGV4EN2025-09-13%2022:41:48Manganese(II))

### 16.4 Disclaimer

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