

Safety Data Sheet

Pharmacy Chemistry Electrolytic Manganese Dioxide (EMD)

Date of Preparation: February 24, 2026 **Revision Number:** 1.0

1. Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product Identifier

- **Product Name:** Pharmacy Chemistry Electrolytic Manganese Dioxide (EMD)
- **Chemical Name:** Manganese Dioxide
- **Synonyms:** EMD, MnO₂, Pyrolusite (synthetic)
- **CAS No.:** 1313-13-9
- **EC No.:** 215-202-6

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

- **Identified Uses:** Oxidizing agent, catalyst intermediate in pharmaceutical and fine chemical synthesis, laboratory-scale and pilot-scale research.
- **Uses Advised Against:** Not for direct human consumption or medical use.

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

1.4 Emergency Telephone Number

- **Emergency Phone:** +8618273793022

2. Hazard(s) Identification

2.1 Classification of the Substance or Mixture According to Regulation (EC) No 1272/2008 (CLP) and OSHA Hazard Communication Standard (29 CFR 1910.1200):

- Not classified as hazardous under normal conditions of use.

2.2 Label Elements

- **GHS Labeling:** No specific labeling required.
- **Signal Word:** None
- **Hazard Statements:** None
- **Precautionary Statements:** None

2.3 Other Hazards

- Fine dust may cause mechanical irritation to eyes and respiratory tract.
- Prolonged or repeated exposure to manganese dust may affect the central nervous system.

3. Composition/Information on Ingredients

3.1 Substances

- **Chemical Name:** Manganese Dioxide
- **Common Name:** Electrolytic Manganese Dioxide (EMD)
- **CAS No.:** 1313-13-9
- **EC No.:** 215-202-6
- **Purity:** $\geq 99.0\%$ MnO₂
- **Impurities:** Fe $\leq 0.01\%$, Pb $\leq 0.002\%$, Cu $\leq 0.002\%$ (trace amounts)

4. First-Aid Measures

4.1 Description of First Aid Measures

- **Inhalation:** Remove victim to fresh air and keep at rest in a position comfortable for breathing. If symptoms persist, call a physician.
- **Skin Contact:** Wash with plenty of soap and water. If skin irritation occurs, get medical advice/attention.
- **Eye Contact:** Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice/attention.
- **Ingestion:** Rinse mouth. Do NOT induce vomiting. Get medical advice/attention if symptoms occur.

4.2 Most Important Symptoms and Effects, Both Acute and Delayed

- **Acute:** May cause mechanical irritation to eyes, skin, and respiratory tract.
- **Delayed:** Prolonged or repeated inhalation of manganese dust may lead to neurological effects (manganism).

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

- Treat symptomatically. Provide general supportive measures and treat symptomatically.

5. Fire-Fighting Measures

5.1 Extinguishing Media

- **Suitable Extinguishing Media:** Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Water spray, dry chemical, CO₂, or foam.
- **Unsuitable Extinguishing Media:** None known.

5.2 Special Hazards Arising from the Substance or Mixture

- Non-flammable. However, it may support combustion of other materials. Thermal decomposition can produce oxygen, which may intensify a fire.

5.3 Advice for Firefighters

- Wear self-contained breathing apparatus (SCBA) and full protective gear for firefighting if necessary.

6. Accidental Release Measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

- Ensure adequate ventilation. Avoid dust formation. Avoid breathing dust. Wear appropriate personal protective equipment as described in Section 8.

6.2 Environmental Precautions

- Do not allow to enter drains, sewers, or watercourses. Collect spillage.

6.3 Methods and Material for Containment and Cleaning Up

- **Small Spills:** Carefully sweep up or vacuum the spilled material. Place in an appropriate container for disposal.
- **Large Spills:** Contain spilled material. Avoid generating dust. Collect using methods that minimize dust generation (e.g., wet sweeping or vacuum with HEPA filter). Dispose of according to local regulations.

6.4 Reference to Other Sections

- For personal protective equipment, see Section 8. For disposal considerations, 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. Provide appropriate exhaust ventilation at places where dust is formed. Wash hands thoroughly after handling.

7.2 Conditions for Safe Storage, Including Any Incompatibilities

- Store in a cool, dry, well-ventilated place. Keep container tightly closed. Store away from incompatible materials (e.g., strong reducing agents, strong acids).

7.3 Specific End Use(s)

- Refer to Section 1.2 for identified uses.

8. Exposure Controls/Personal Protection

8.1 Control Parameters

- **Occupational Exposure Limits (OELs):**
 - **OSHA PEL (Permissible Exposure Limit):** Manganese compounds (as Mn): 5 mg/m³ (ceiling)
 - **ACGIH TLV (Threshold Limit Value):** Manganese, elemental and inorganic compounds (as Mn): 0.02 mg/m³ (respirable fraction), 0.1 mg/m³ (inhalable fraction)

8.2 Exposure Controls

- **Engineering Controls:** Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. Ensure that eyewash stations and safety showers are close to the workstation location.
- **Individual Protection Measures, Such as Personal Protective Equipment (PPE)**
 - **Eye/Face Protection:** Safety glasses with side-shields or chemical safety goggles.
 - **Skin Protection:** Protective gloves (e.g., nitrile, PVC) and protective clothing to prevent skin contact.
 - **Respiratory Protection:** If exposure limits are exceeded or irritation is experienced, NIOSH-approved respirators (e.g., P100 particulate filter) should be worn.
 - **Thermal Hazards:** Not applicable.

9. Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

- **Appearance:** Black powder
- **Odor:** Odorless

- **Odor Threshold:** Not applicable
- **pH (10% slurry):** 4.0 – 6.5
- **Melting Point/Freezing Point:** ~535 °C (decomposes)
- **Initial Boiling Point and Boiling Range:** Not applicable (decomposes)
- **Flash Point:** Not applicable
- **Evaporation Rate:** Not applicable
- **Flammability (solid, gas):** Non-flammable
- **Upper/Lower Flammability or Explosive Limits:** Not applicable
- **Vapor Pressure:** Not applicable
- **Vapor Density:** Not applicable
- **Relative Density (Water = 1):** ~5.0 g/cm³
- **Solubility(ies):** Insoluble in water; soluble in strong acids with reduction.
- **Partition Coefficient: n-octanol/water:** Not applicable
- **Auto-ignition Temperature:** Not applicable
- **Decomposition Temperature:** >535 °C
- **Viscosity:** Not applicable (solid)
- **Explosive Properties:** Not explosive
- **Oxidizing Properties:** Oxidizing agent

9.2 Other Information

- **MnO₂ Content:** ≥ 99.0%
- **Mn (Total):** ≥ 63.0%
- **Surface Area:** 30 – 60 m²/g
- **Particle Size (D50):** 5 – 20 μm

10. Stability and Reactivity

10.1 Reactivity

- Stable under recommended storage conditions.

10.2 Chemical Stability

- Stable under normal conditions of use and storage. Decomposes at temperatures above 535 °C, releasing oxygen.

10.3 Possibility of Hazardous Reactions

- Reacts with strong reducing agents. Reacts with strong acids to produce chlorine gas (with HCl) or oxygen (with H₂SO₄).

10.4 Conditions to Avoid

- High temperatures, incompatible materials.

10.5 Incompatible Materials

- Strong reducing agents, strong acids, organic materials (may cause fire or explosion).

10.6 Hazardous Decomposition Products

- Oxygen (at high temperatures), chlorine (with HCl), other manganese oxides.

11. Toxicological Information

11.1 Information on Toxicological Effects

- **Acute Toxicity:**
 - **Oral LD₅₀ (rat):** >2000 mg/kg (Manganese Dioxide is generally considered to have low acute toxicity via oral route).
 - **Dermal LD₅₀:** No data available.
 - **Inhalation LC₅₀:** No data available.
- **Skin Corrosion/Irritation:** May cause mechanical irritation.
- **Serious Eye Damage/Irritation:** May cause mechanical irritation.
- **Respiratory or Skin Sensitization:** Not expected to be a sensitizer.
- **Germ Cell Mutagenicity:** No data available.
- **Carcinogenicity:** Not classified as a carcinogen by IARC, NTP, or OSHA.
- **Reproductive Toxicity:** No data available.
- **STOT-Single Exposure:** May cause respiratory irritation if inhaled as fine dust.

- **STOT-Repeated Exposure:** Prolonged or repeated inhalation of manganese dust may lead to neurological effects (manganism), characterized by tremors, psychological disturbances, and motor dysfunction.
- **Aspiration Hazard:** Not an aspiration hazard.

12. Ecological Information

12.1 Toxicity

- **Aquatic Toxicity:** Manganese compounds can be toxic to aquatic organisms at high concentrations. However, manganese dioxide is largely insoluble in water, limiting its bioavailability.

12.2 Persistence and Degradability

- Manganese dioxide is an inorganic compound and is not expected to be biodegradable. It is persistent in the environment.

12.3 Bioaccumulative Potential

- Manganese can bioaccumulate in some organisms, but the insoluble nature of manganese dioxide limits its bioaccumulation potential.

12.4 Mobility in Soil

- Low mobility in soil due to its insolubility.

12.5 Results of PBT and vPvB Assessment

- Not applicable as manganese dioxide is an inorganic substance.

12.6 Other Adverse Effects

- No other adverse environmental effects are expected from this product.

13. Disposal Considerations

13.1 Waste Treatment Methods

- **Product:** Dispose of in accordance with local, regional, national, and international regulations. Chemical waste generators must determine whether a

discarded chemical is classified as a hazardous waste. Ensure compliance with all applicable regulations.

- **Contaminated Packaging:** Dispose of as unused product.

14. Transport Information

14.1 UN Number

- Not regulated 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.

14.7 Transport in Bulk According to Annex II of MARPOL ⁷³/₇₈ and the IBC Code

- Not applicable.

15. Regulatory Information

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

- **USA:** OSHA Hazard Communication Standard (29 CFR 1910.1200), TSCA (Toxic Substances Control Act) compliant.

- **Europe:** REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) compliant, CLP Regulation (EC) No 1272/2008.
- **Canada:** WHMIS (Workplace Hazardous Materials Information System) compliant.

15.2 Chemical Safety Assessment

- A Chemical Safety Assessment has not been carried out for this substance.

16. Other Information

16.1 Indication of Changes

- First edition.

16.2 Abbreviations and Acronyms

- **CAS:** Chemical Abstracts Service
- **EC:** European Community
- **GHS:** Globally Harmonized System of Classification and Labelling of Chemicals
- **LD₅₀:** Lethal Dose, 50%
- **LC₅₀:** Lethal Concentration, 50%
- **OEL:** Occupational Exposure Limit
- **PEL:** Permissible Exposure Limit
- **TLV:** Threshold Limit Value
- **ACGIH:** American Conference of Governmental Industrial Hygienists
- **OSHA:** Occupational Safety and Health Administration
- **NIOSH:** National Institute for Occupational Safety and Health
- **STOT:** Specific Target Organ Toxicity
- **PBT:** Persistent, Bioaccumulative and Toxic
- **vPvB:** very Persistent and very Bioaccumulative
- **EMD:** Electrolytic Manganese Dioxide
- **API:** Active Pharmaceutical Ingredient
- **ICP-OES:** Inductively Coupled Plasma - Optical Emission Spectrometry

- **BET:** Brunauer-Emmett-Teller (surface area analysis)

16.3 Key Literature References and Sources for Data

- Information extracted from the product webpage:
[\[https://manganesesupply.com/pharmacy-chemistry-electrolytic-manganese-dioxide/\]](https://manganesesupply.com/pharmacy-chemistry-electrolytic-manganese-dioxide/)
- General chemical safety databases and regulatory information.

16.4 Disclaimer

- The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.