

# MATERIAL SAFETY DATA SHEET (MSDS)

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According to GHS (Globally Harmonized System)

## SECTION 1: Identification of the Substance/Mixture and of the Company

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- **1.1 Product Identifier:** MnO<sub>2</sub> Nanoparticles for Supercapacitors
- **1.2 Relevant Identified Uses:** Laboratory chemicals, manufacture of substances, electrode material for supercapacitors.
- **1.3 Details of the Supplier:**
  - **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:** +86 18273793022
  - **Website:** manganesesupply.com
- **1.4 Emergency Telephone Number:** +86 18273793022

## SECTION 2: Hazards Identification

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- **2.1 Classification of the Substance:**
  - Acute toxicity, Oral (Category 4), H302
  - Acute toxicity, Inhalation (Category 4), H332
- **2.2 GHS Label Elements:**
  - **Pictogram:** Exclamation Mark
  - **Signal Word:** Warning

- **Hazard Statements:**
  - H302 + H332: Harmful if swallowed or if inhaled.
- **Precautionary Statements:**
  - P261: Avoid breathing dust/fume/gas/mist/vapors/spray.
  - P264: Wash skin thoroughly after handling.
  - P270: Do not eat, drink or smoke when using this product.
  - P301 + P312: IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
  - P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

## SECTION 3: Composition/Information on Ingredients

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- **Substance Name:** Manganese Dioxide (MnO<sub>2</sub>)
- **CAS No.:** 1313-13-9
- **EC No.:** 215-202-6
- **Purity:** ≥ 99.0%
- **Form:** Nanoparticles (20–80 nm)

## SECTION 4: First Aid Measures

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- **Inhalation:** If inhaled, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
- **Skin Contact:** Wash off with soap and plenty of water. Consult a physician.
- **Eye Contact:** Flush eyes with water as a precaution.
- **Ingestion:** Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

## SECTION 5: Firefighting Measures

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- **Extinguishing Media:** Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
- **Special Hazards:** Manganese/manganese oxides.
- **Advice for Firefighters:** Wear self-contained breathing apparatus for firefighting if necessary.

## SECTION 6: Accidental Release Measures

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- **Personal Precautions:** Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation.
- **Environmental Precautions:** Do not let product enter drains.
- **Methods for Cleaning Up:** Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

## SECTION 7: Handling and Storage

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- **Handling:** Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed.
- **Storage:** Store in a cool place. Keep container tightly closed in a dry and well-ventilated place.

## SECTION 8: Exposure Controls/Personal Protection

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- **Control Parameters:** TWA 0.2 mg/m<sup>3</sup> (as Mn).
- **Exposure Controls:**
  - **Eye Protection:** Safety glasses with side-shields.
  - **Skin Protection:** Handle with gloves.
  - **Body Protection:** Complete suit protecting against chemicals.
  - **Respiratory Protection:** For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator.

## SECTION 9: Physical and Chemical Properties

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- **Appearance:** Black/Dark Brown Fine Powder (Nanoparticles)
- **Odour:** Odourless
- **pH:** 5.5–7.5 (5% slurry)
- **Melting Point:** 535 °C (decomposes)
- **Boiling Point:** N/A
- **Flash Point:** N/A
- **Relative Density (Tap):** 0.4–0.8 g/cm<sup>3</sup>
- **Water Solubility:** Insoluble
- **Particle Size:** 20–80 nm
- **Specific Surface Area:** 120–220 m<sup>2</sup>/g

## SECTION 10: Stability and Reactivity

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- **Reactivity:** No data available.
- **Chemical Stability:** Stable under recommended storage conditions.
- **Conditions to Avoid:** Heat, flames and sparks.
- **Incompatible Materials:** Strong acids, Strong reducing agents, Organic materials.
- **Hazardous Decomposition Products:** Other decomposition products - No data available.

## SECTION 11: Toxicological Information

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- **Acute Toxicity:** LD50 Oral - Rat - > 3,478 mg/kg.
- **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.

## SECTION 12: Ecological Information

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- **Toxicity:** No data available.
- **Persistence and Degradability:** No data available.
- **Bioaccumulative Potential:** No data available.
- **Mobility in Soil:** No data available.

## SECTION 13: Disposal Considerations

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- **Product:** Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.
- **Contaminated Packaging:** Dispose of as unused product.

## SECTION 14: Transport Information

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- **DOT (US):** Not dangerous goods.
- **IMDG:** Not dangerous goods.
- **IATA:** Not dangerous goods.

## SECTION 15: Regulatory Information

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- **Safety, health and environmental regulations:** This safety datasheet complies with the requirements of Regulation (EC) No. <sup>1907</sup>/2006.

## SECTION 16: Other Information

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- **Further Information:** The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. BTLnewmaterial shall not be held liable for any damage resulting from handling or from contact with the above product.