Safety Data Sheet: Manganese Dioxide Supported Catalyst for CO Oxidation

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

- **Product Name:** Manganese Dioxide Supported Catalyst for CO Oxidation
- **Chemical Name:** Manganese Dioxide (MnO_2)
- **CAS No.:** 1313-13-9

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

- **Identified Uses:** Catalytic oxidation of carbon monoxide, industrial exhaust gas treatment, air purification, laboratory catalytic research.

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 Number:** (800) 424-9980 (Chemtrec, as per Flinn Scientific SDS for general chemical emergencies)

SECTION 2: Hazards Identification

2.1 Classification of the substance or mixture

- **GHS Classification:**
  - Acute toxicity, oral (Category 5) - May be harmful if swallowed (H303)
  - Acute toxicity, inhalation (Category 4) - Harmful if inhaled (H332)

2.2 GHS Label elements, including precautionary statements

- **Pictogram:** Exclamation Mark
- **Signal Word:** WARNING
- **Hazard Statements:**
  - H303: May be harmful if swallowed.
  - H332: Harmful if inhaled.
- **Precautionary Statements:**
  - **Prevention:**
    - P261: Avoid breathing dust.
    - Wash face, hands and any exposed skin thoroughly after handling.
    - Do not eat, drink or smoke when using this product.
  - **Response:**
    - P312: Call a POISON CENTER or physician if you feel unwell.
    - P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
    - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do so. Continue rinsing.
    - IF ON SKIN: Wash with plenty of water.
  - **Storage:** Store in a cool, dry place.
  - **Disposal:** Dispose of contents and container to an approved waste disposal plant.

SECTION 3: Composition/Information on Ingredients

Component Name	CAS Number	Formula	Formula Weight	Concentration
Manganese dioxide	1313-13-9	MnO_2	86.94	85-95%

SECTION 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:** 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:** 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

- The most important known symptoms and effects are described in the labelling (Section 2.2) and/or in Section 11.

4.3 Indication of any immediate medical attention and special treatment needed

- No data available.

SECTION 5: Fire-fighting 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

- Nonflammable, noncombustible solid. Strong oxidizer, fire hazard when in contact with combustible materials. When heated to decomposition, may emit toxic fumes.

5.3 Advice for firefighters

- Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

- Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

6.2 Environmental precautions

- Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

- Sweep up and shovel. Keep in suitable, closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

6.4 Reference to other sections

- For disposal see section 13.

SECTION 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. Keep away from combustible material. Normal measures for preventive fire protection.

7.2 Conditions for safe storage, including any incompatibilities

- Store in a cool, dry place. Store in a tightly closed container. Store with hydroxides, oxides, silicates and carbonates. Keep away from moisture and strong reducing agents.

7.3 Specific end use(s)

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

SECTION 8: Exposure Controls/Personal Protection

8.1 Control parameters

- **Exposure Guidelines:** Ceiling 5 mg/m^3 (OSHA); 0.1 mg/m^3 (inhalable fraction) (ACGIH)

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.
  - **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).

SECTION 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

- **Appearance:** Black or silver crystals or powder
- **Odor:** Odorless
- **Odor Threshold:** No data available
- **pH:** No data available
- **Melting point/freezing point:** 535 °C (decomposes)
- **Initial boiling point and boiling range:** No data available
- **Flash point:** Not applicable
- **Evaporation rate:** No data available
- **Flammability (solid, gas):** Nonflammable, noncombustible solid
- **Upper/lower flammability or explosive limits:** No data available
- **Vapor pressure:** No data available
- **Vapor density:** No data available
- **Relative density:** 5.026 (Specific gravity)
- **Water solubility:** Insoluble in water
- **Partition coefficient: n-octanol/water:** No data available
- **Auto-ignition temperature:** No data available
- **Decomposition temperature:** 535 °C
- **Viscosity:** Not applicable (solid)
- **Explosive properties:** No data available
- **Oxidizing properties:** Strong oxidizer

9.2 Other information

- **MnO_2 Purity:** 85–95%
- **Particle Size:** 1–10 µm

- **BET Surface Area:** 60–150 m^2/g
- **Moisture Content:** ≤2.0%
- **Bulk Density:** 0.45–0.75 g/cm^3
- **Crystal Phase:** Mainly γ-MnO_2 / amorphous MnO_2

SECTION 10: Stability and Reactivity

10.1 Reactivity

- May ignite organic materials, and is a strong oxidant that reacts violently with combustible and reducing agents.

10.2 Chemical stability

- Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

- Reacts violently with combustible and reducing materials. This generates fire and explosion hazard. Reacts with aluminium on heating.

10.4 Conditions to avoid

- Heat, flames and sparks. Incompatible materials.

10.5 Incompatible materials

- Strong reducing agents, organic materials, combustible materials, aluminum.

10.6 Hazardous decomposition products

- Other decomposition products - No data available.
- In the event of fire: see section 5.

SECTION 11: Toxicological Information

11.1 Information on toxicological effects

- **Acute toxicity:**

    - **Oral LD50:** ORL-RAT LD50: 3478 mg/kg
    - **Inhalation LC50:** No data available (Harmful if inhaled)
    - **Dermal LD50:** No data available
- **Skin corrosion/irritation:** No data available (Causes mild skin irritation - from other SDS, but Flinn says N.A.)
- **Serious eye damage/eye irritation:** Irritating to eyes (from other SDS, but Flinn says N.A.)
- **Respiratory or skin sensitization:** 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.
- **Reproductive toxicity:** No data available
- **Specific target organ toxicity - single exposure:** May cause respiratory irritation.
- **Specific target organ toxicity - repeated exposure:** May cause damage to organs (Brain, Lungs) through prolonged or repeated exposure.
- **Aspiration hazard:** No data available
- **Additional Information:** 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.

SECTION 12: Ecological Information

12.1 Toxicity

- No data available.

12.2 Persistence and degradability

- The methods for determining the biological degradability are not applicable to inorganic substances.

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.

SECTION 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. Dispose of contents/container in accordance with local/regional/national/international regulations.
- **Contaminated packaging:** Dispose of as unused product.

SECTION 14: Transport Information

14.1 UN number

- Not regulated.

14.2 UN proper shipping name

- Not regulated.

14.3 Transport hazard class(es)

- N/A

14.4 Packing group

- N/A

14.5 Environmental hazards

- No data available.

14.6 Special precautions for user

- No data available.

SECTION 15: Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

- **US Federal Regulations:**
  - TSCA-listed
  - EINECS-listed (215-202-6)
  - RCRA code D001
- **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:
  - Manganese compounds (as Mn) - CAS No. 7439-96-5 (Note: Manganese Dioxide is a manganese compound)
- **SARA $^{311}/_{312}$ Hazards:** Acute Health Hazard, Chronic Health Hazard, Fire Hazard (Oxidizer)
- **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.

SECTION 16: Other Information

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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.