

## ***Material Safety Data Sheet***

Identity: Manganese Oxide

Formula: MnO

### SECTION I - GENERAL INFORMATION

Manufacturer: [Stanford Advanced Materials](#) (SAM)

The information below is believed to be accurate and represents the best information available to SAM. However, SAM makes no warranty, expressed or implied with respect to such information and assumes no liability resulting from its use.

### SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Molecular weight: 70.94

| CAS #     | OSHA PEL            | ACGIH TLV             | % |
|-----------|---------------------|-----------------------|---|
| 1344-43-0 | 5 mg/m <sup>3</sup> | 0.2 mg/m <sup>3</sup> |   |

### SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

Physical States: Solid

Boiling Point: N/A

Vapor Pressure (vs. air or mmHg): N/A

Melting Point: 1650.00 C (3002.0 F)

Density: 5.45 g/cm<sup>3</sup>

Evaporation Rate: N/A

Flash Point: N/A

Solubility in water: Soluble in acids

*Appearance and odor:* Green powder and pieces, no odor

### SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

*Method Used:* Unknown

*Explosive Limits:* LEL: N/A

UEL: N/A

*Extinguishing Media:* Use suitable extinguishing agent for surrounding material and type of fire

#### *Special Fire Fighting Procedures:*

Firefighters must wear full face, self-contained breathing apparatus with full protective clothing to prevent contact with skin and eyes. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.

#### *Unusual Fire and Explosion Hazards:*

Violent reaction with hydrogen peroxide, calcium oxychloride and fluorine. Manganese oxide converts to manganese tetroxide if heated in air.

SECTION V - REACTIVITY DATA

*Stability:* Stable

*Conditions to Avoid (instability):* None

*Incompatibility (materials to avoid):* Hydrogen peroxide, calcium oxychloride and fluorine.

*Hazardous Decomposition or Byproducts:* Thermal decomposition of manganese dust can react with water to produce hydrogen and unsaturated hydrocarbons in the event of combustion.

*Hazardous Polymerization:* Will not occur.

*Conditions to avoid (hazardous polymerization):* None.

SECTION VI - HEALTH HAZARD DATA

*Routes of entry:* Inhalation? Yes      Skin? Yes      Eyes? Yes      Ingestion? Yes Other?

*Signs and Symptoms of Overexposure:*

*Inhalation:* May cause red, dry throat. Metal fume fever may cause: chills, fever, muscle aches, headache, dry throat, sleepiness, weakness in the legs, muscular twitchings, nocturnal leg cramps and slowness of speech. Manganism may cause: a slapping gait, cramps, tremors, slurred speech, hallucinations, insomnia and mental confusion. These symptoms resemble Parkinson's disease. Other symptoms of manganism include: inflammation of the kidneys, cirrhosis of the liver, anorexia, muscular fatigue, sexual impotence, reduction of the white blood cells and anemia.

*Ingestion:* No acute or chronic health effects recorded.

*Skin:* May cause redness, itching.

*Eye:* May cause redness, itching and watering.

*Health Hazards (Acute and Chronic):*

*Inhalation:*

Acute: Inhalation of Manganese compounds is considered the primary route of exposure, they may cause irritation of the respiratory tract and mucous membranes. Inhalation of manganese compounds' fine dusts and fumes may cause metal fume fever.

Chronic: Chronic inhalation of manganese compounds' dust particles, approximately 3 um in size, for a period of a few months may cause pulmonary pneumonitis. Manganese compounds may also cause manganism, psychic and neurological disorders effecting the central nervous system, to develop (not fatal, but can cause permanent disability).

*Ingestion:*

Acute: Absorption of manganese compounds from the gastrointestinal tract is poor under normal conditions.

Chronic: No chronic health effects recorded.

*Skin:*

Acute: May cause irritation. Moderately toxic by subcutaneous route.

Chronic: May cause dermatitis.

*Eye:*

Acute: May cause irritation.

Chronic: Irritant salts may cause conjunctivitis damage.

*Target Organs:* May effect the central nervous system, kidneys, respiratory system and liver.

*Carcinogenicity:* NTP? No IARC Monographs? No OSHA Regulated? No

*Medical Conditions Generally Aggravated by Exposure:* It has been recorded that when exposed to manganese dust and fumes, there is a higher incidence of upper respiratory infection and pneumonia compared to the general population.

*Emergency and First Aid Procedures:*

*Inhalation:* Remove victim to fresh air, keep warm and quiet, and give oxygen if breathing is difficult; seek medical attention

*Ingestion:* Give 1-2 glasses of milk or water and induce vomiting, seek medical attention. Never induce vomiting or give anything by mouth to an unconscious person

*Skin:* Remove contaminated clothing, brush material off skin, wash affected area with mild soap and water, and seek medical attention if symptoms persist

*Eye:* Flush eyes with lukewarm water, lifting upper and lower eyelids for at least 15 minutes and seek medical attention

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

*Steps to be taken in case material is released or spilled:*

Wear appropriate respiratory and protective equipment specified in section VIII. Isolate spill area, provide ventilation and extinguish sources of ignition. Vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust.

*Waste disposal method:*

Dispose of in accordance with state, local, and federal regulations.

*Hazard Label Information:*

Store in cool, dry area and in tightly sealed container. Wash thoroughly after handling.

SECTION VIII - CONTROL MEASURES

*Protective Equipment Summary (Hazard Label Information):*

NIOSH approved respirator, impervious gloves, safety glasses, clothes to prevent contact.

*Ventilation:*

Local Exhaust: To maintain concentration at low exposure levels.

Mechanical (General): Recommended.

*Work/Hygienic/Maintenance Practices:*

Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating or smoking. Do not blow dust off clothing or skin with compressed air.

Please be advised that N/A can either mean Not Applicable or No Data Has Been Established