

Material Safety Data Sheet

Identity: Manganese

Formula: Mn

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

Form Weight: 54.94

CAS #	OSHA PEL	ACGIH TLV	%
7439-96-5	5mg/M ³	5mg/M ³	0.0-100%

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

Physical States: Solid

Boiling Point: 1962.00 °C

Vapor Pressure: (vs. air or mmHg): 1mm at 1292.00 °C

Melting Point: 1241.00 °C

Vapor Density: (vs. air=): N/A

Evaporation Rate: N/A

Percent Volatile: N/A

Solubility in water: Decomposes

Specific Gravity: (H₂O=1):*Appearance and odor:* Grey powder, no odor.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA:

Flash Point: N/A

Method Used: Flammable solid

Explosive Methods: LEL-N/A

UEL:N/A

Extinguishing Media:

Use suitable extinguishing agent for metal fires. DO NOT USE WATER.

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 Explosive Hazards:

Flammable and moderately explosive in the form of dust or powder when exposed to flame. Dust may be phosphoric in air and may explode when heated in carbon dioxide. Mixtures of aluminum dust and manganese dust may explode in air. Mixtures with ammonium nitrate may explode when heated. May ignite on contact with fluorine, chlorine + heat, hydrogen peroxide, bromine pent fluoride, sulfur dioxide + heat. Violent reaction with NO₂ + oxidants. Incandescent reactions with phosphorus, nitril fluoride, nitric acid. Will react with water of steam to product hydrogen. May react with oxidizing agents.

SECTION V - REACTIVITY DATA

Stability: Stable

Conditions to Avoid (Stability): None

Incompatibility – Materials to avoid: Carbon dioxide, aluminum dust, ammonium nitrate, fluorine, chlorine + heat, hydrogen peroxide, bromine pent fluoride, sulfur dioxide + heat, NO₂ + oxidants, phosphorous, nitril fluoride, nitric acid, oxidizing agents, water and steam.

Hazardous Decomposition or Byproducts: Hydrogen gas

Hazardous Polymerization: Will not occur.

Conditions to Avoid (hazardous polymerization): None

SECTION VI - HEALTH HAZARD DATA

Routes of entry: Inhalation? Yes Skin? No Eyes? No Ingestion? No Other? No

Signs of Exposure:

Inhalation: May cause red, dry throat plus chills, fever, muscle aches, sleepiness, weakness in the legs, muscular twitching, and cramps. Other symptoms like slurred speech, tremors, insomnia, and mental confusion, will resemble Parkinson's Disease.

Ingestion: None recorded.

Skin: May cause redness and itching.

Eye: May cause redness, itching, and watering.

Health Hazards (Acute and Chronic):

Some manganese compounds are experimental tumorigens. They can cause nervous and pulmonary system damage by inhalation of fumes and dust. Very few poisonings have occurred by ingestion. Chronic manganese poisoning is a clearly characterized disease which results from inhalation of fumes or dusts or manganese. The central nervous system is the chief site of damage. Exposure to dusts and fumes can possibly increase the incidence of upper respiratory infections and pneumonia. (Sax, *Dangerous Properties of Industrial Materials*, Eight edition)

Inhalation:

Acute: Primary route of exposure: May cause irritation to respiratory tract and mucous membranes.

Chronic: Metal fume fever, pulmonary pneumonitis, decrease in hemoglobin, change in erythrocyte levels, and fibrotic change in the lungs.

Ingestion:

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

Chronic: None recorded.

Skin:

Acute: May cause irritation.

Chronic: May cause dermatitis.

Eye:

Acute: May cause irritation.

Chronic: Can cause conjunctive damage.

Target Organ: Control nervous system, kidneys, respiratory system and liver. *Carcinogenicity:*

NTP? No

IARC Monographs? No

OSHA Regulated? No

Medical Conditions Aggravated by Exposure: Upper respiratory infections and pneumonia.

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: N/A.... Seek medical advise.

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 if symptoms persist.

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-Control Measures. Isolate spill area, provide ventilation. 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.

Other:

Manganese metal will react with water or steam. Handle and store in a controlled environment and inert gas as Argon (Ar).

SECTION VIII - CONTROL MEASURES

Protective Equipment Summary (Hazard Label Information):

NIOSH approved respirator, impervious gloves, safety glasses, clothes to prevent contact, goggles or face shield.

Ventilation:

Local Exhaust: To maintain concentration at low exposure levels.

Mechanical (General): Recommended.

Special: Handle and store in a controlled environment and inert gas such as Argon (Ar).

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
