

MATERIAL SAFETY DATA SHEET

I PRODUCT IDENTIFICATION

Trade Name: Manganese Sulfide **Chemical Family:** Metal Sulfide
Molecular Weight: 87.00 **Molecular Formula:** MnS
CAS #: 18820-29-6
Synonyms: Manganese (II) Sulfide, Natural Alabandite, Manganese Monosulfide, Manganous Sulfide

II HAZARDOUS INGREDIENTS

<u>Hazardous Components:</u>	<u>OSHA PEL:</u>	<u>ACGIH TLV:</u>	<u>Other Limits:</u>	<u>Percentage:</u>
Manganese Sulfide	5 mg (Mn)/m ³	5 mg (Mn)/m ³	Ceiling	0.0-100.0

Sec. 302 (EHS): No **Sec. 304 RQ:** No **Sec. 313:** Yes

HMIS Protective Equipment: Glasses, gloves, clothing, combo resp.

HMIS Ratings (0-4): **Health:** 2 **Flammability:** 3 **Reactivity:** 2

III PHYSICAL DATA

Boiling Point 760 mm Hg:	N/E or N/A	Specific Gravity (H₂O=1):	3.99 gm/cc
Vapor Pressure (mm Hg):	N/A	Vapor Density (Air=1):	N/A
% Volatiles by Weight:	N/A	Solubility in H₂O:	Slightly Soluble
Physical States:	Solid	Evaporation Rate:	N/A
Appearance and Odor:	Pink-green or brown powder; may have rotten egg odor.		

IV FIRE AND EXPLOSION HAZARDS DATA

Flash Point (Method Used): N/A (Flammable Solid)

Flammable Limits: Upper: N/E **Lower:** N/E

Extinguishing Media: USE: Class D or other suitable metal extinguishing agent. DO NOT USE WATER!!!

Special Fire Fighting Procedures: Wear NIOSH/MSHA approved self contained breathing apparatus, protective clothing, boots and gloves. If without risk, remove material from fire area.

Unusual Fire & Explosion Hazards: Flammable when heated to flame or by spontaneous chemical reaction. When heated to decomposition, manganese sulfide may emit toxic fumes of oxides of sulfur. Decomposes in air to manganese oxide. In moist conditions it readily oxidizes in air to the sulfate. Reacts with water, moisture, or steam to evolve toxic and flammable hydrogen sulfide.

V HEALTH HAZARD INFORMATION

Routes of Entry: Inhalation, Eyes, Ingestion.

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 general population.

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

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

LD50/LC50: No toxicity data recorded.

Health Hazards (Acute and Chronic):

To the best of our knowledge the chemical, physical and toxicological properties of manganese sulfide have not been thoroughly investigated and recorded.

Manganese compounds can cause central nervous system and pulmonary system damage by inhalation of fumes and dust. Very few poisonings have occurred from ingestion. Chronic manganese poisoning is a clearly characterized disease which results from inhalation of fumes or dust of manganese. Exposure to heavy concentrations of dusts or fumes for as little as three months may produce the condition, but usually cases develop after 1-3 years of exposure. 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. Chronic manganese poisoning usually begins with complaints of languor and sleepiness. This is followed by weakness in the legs and the development of stolid, mask-like faces. The patient speaks with a slow monotonous voice. Then muscular twitching appears, varying from a fine tremor of the hands to coarse rhythmical movements of the arms, legs, and trunk. Nocturnal cramps of the legs appear about the same time. There is a slight increase in tendon reflexes, ankle and patellar clonus, and typical Parkinsonian slapping gait (Sax, Dangerous Properties of Industrial Materials, eighth edition).

Sulfides have variable toxicity. The alkaline sulfides (potassium, calcium, ammonium and sodium) are similar in action to alkalis. They cause softening and irritation of the skin. If ingested they are corrosive and irritating through the liberation of hydrogen sulfide and free alkali (Sax, Dangerous Properties of Industrial Materials, eighth edition).

Inhalation: Acute: May cause irritation of the respiratory tract, mucous membranes and metal fume fever.

Chronic: May cause pulmonary pneumonitis, manganism, psychic and neurological disorders effecting the central nervous system.

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.

Chronic: May cause dermatitis.

Eye: Acute: May cause irritation.

Chronic: Irritant salts may cause conjunctivitis damage.

Signs and Symptoms of Exposure:

Inhalation: May cause red, dry throat. Metal fume fever may cause: Chills, fever, muscle aches, headache, dry throat, sleepiness, weakness in the legs, muscular twitching, nocturnal leg cramps and slowness of speech. Manganism may cause 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, burning sensation and inflammation.

Eye: May cause redness, itching, burning sensation, inflammation and watering.

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Remove victim to fresh air; keep warm and quiet; give oxygen if breathing is difficult and seek medical attention immediately.

INGESTION: Give 1-2 glasses of water or milk 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 soap and water. Seek medical attention.

EYE: Flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention.

VI REACTIVITY DATA

Stability: Stable

Incompatibility (Material to Avoid): Water, moisture, steam, air, oxidizing agents and strong acids.

Hazardous Polymerization: Will not occur

Hazardous Decomposition Products: Oxides of sulfur and manganese.

VII SPILL OR LEAK PROCEDURES

Steps to Be Taken in Case Material Is Released or Spilled: Wearing suitable respiratory protection and protective clothing. 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. Use non-sparking tools.

Waste Disposal Method: Consult Local, State and Federal regulations for proper disposal of manganese.

Hazard Label Information: Store in a cool, dry area. Wash thoroughly after handling. Store in tightly sealed container.

Other Precautions: Avoid breathing dusts and use adequate ventilation.

VIII SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type): NIOSH/MSHA approved, respirator for hazardous dusts and mists or self-contained breathing apparatus.

Ventilation: Local Exhaust: To maintain concentration at or below the PEL, TLV **Mechanical:** Not recommended

Eye Protection: Face shield and chemical safety goggles.

Protective Gloves: Rubber

Other Protective Equipment: Safety shower and eyewash fountain. Coveralls, laboratory coat or chemical safety apron.

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 and smoking. Do not blow dust off clothing or skin with compressed air.

IX SPECIAL PRECAUTIONS

Some of the chemicals listed herein are research or experimental substances which may be toxic, as defined by various governmental regulations. In accordance with Environmental Protection Agency regulations and the Toxic Substance Control Act (TSCA), these materials should only be handled by, or under the direct supervision of a "technically qualified individual", as defined in 40 CFR 710.2(aa).

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