

Material Safety Datasheet (MSDS) for Calcium Manganese Oxide (CMO)

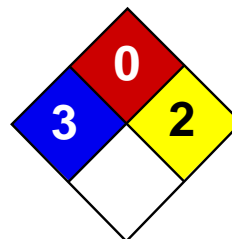
CMO is composed of following oxides

- Calcium oxide (CaO)

- Manganese oxide
 - o MnO
 - o MnO₂
 - o Mn₂O₃
 - o Mn₃O₄

The MSDS for all the individual oxides is provided in this document.

Please turn to next page for individual MSDSs.



Health	3
Fire	0
Reactivity	2
Personal Protection	J

Material Safety Data Sheet

Calcium oxide MSDS

Section 1: Chemical Product and Company Identification

Product Name: Calcium oxide

Catalog Codes: SLC5248, SLC4246, SLC1453

CAS#: 1305-78-8

RTECS: EW3100000

TSCA: TSCA 8(b) inventory: Calcium oxide

CI#: Not applicable.

Synonym: Quicklime; Lime

Chemical Name: Calcium oxide

Chemical Formula: CaO

Contact Information:

Sciencelab.com, Inc.

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: ScienceLab.com

CHEMTREC (24HR Emergency Telephone), call:

1-800-424-9300

International CHEMTREC, call: 1-703-527-3887

For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Calcium oxide	1305-78-8	100

Toxicological Data on Ingredients: Calcium oxide LD50: Not available. LC50: Not available.

Section 3: Hazards Identification

Potential Acute Health Effects:

Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (corrosive, permeator), of eye contact (corrosive). The amount of tissue damage depends on length of contact. Eye contact can result in corneal damage or blindness. Skin contact can produce inflammation and blistering. Inhalation of dust will produce irritation to gastro-intestinal or respiratory tract, characterized by burning, sneezing and coughing. Severe over-exposure can produce lung damage, choking, unconsciousness or death. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated exposure of the eyes to a low level of dust can produce eye irritation. Repeated skin exposure can produce local skin destruction, or dermatitis. Repeated inhalation of dust can produce varying degree of respiratory irritation or lung damage.

Section 4: First Aid Measures

Eye Contact:

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. WARM water MUST be used. Get medical attention immediately.

Skin Contact:

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

Ingestion:

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Section 5: Fire and Explosion Data

Flammability of the Product: Non-flammable.

Auto-Ignition Temperature: Not applicable.

Flash Points: Not applicable.

Flammable Limits: Not applicable.

Products of Combustion: Not available.

Fire Hazards in Presence of Various Substances: Not applicable.

Explosion Hazards in Presence of Various Substances:

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions: Not applicable.

Special Remarks on Fire Hazards: Chlorine Trifluoride reacts violently with calcium oxide producing flame.

Special Remarks on Explosion Hazards: Not available.

Section 6: Accidental Release Measures

Small Spill:

Use appropriate tools to put the spilled solid in a convenient waste disposal container. If necessary: Neutralize the residue with a dilute solution of acetic acid.

Large Spill:

Corrosive solid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal.

Neutralize the residue with a dilute solution of acetic acid. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Section 7: Handling and Storage

Precautions:

Keep container dry. Do not breathe dust. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, seek medical attention and show the label when possible. Avoid contact with skin and eyes. Keep away from incompatibles such as organic materials, acids, moisture.

Storage: Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 24°C (75.2°F).

Section 8: Exposure Controls/Personal Protection

Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Personal Protection:

Splash goggles. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor and dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

TWA: 2 (mg/m³) from ACGIH (TLV) [United States] TWA: 2 (mg/m³) [Canada] TWA: 5 (mg/m³) from OSHA (PEL) [United States] Consult local authorities for acceptable exposure limits.

Section 9: Physical and Chemical Properties

Physical state and appearance: Solid. (Crystalline solid.)

Odor: Odorless.

Taste: Not available.

Molecular Weight: 56.08 g/mole

Color: White.

pH (1% soln/water): 10 [Basic.]

Boiling Point: 2850°C (5162°F)

Melting Point: 2572°C (4661.6°F)

Critical Temperature: Not available.

Specific Gravity: 3.33 (Water = 1)

Vapor Pressure: Not applicable.

Vapor Density: Not available.

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ionicity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:

Soluble in acids, glycerol, sugar solution. Practically insoluble in alcohol. Very slightly soluble in cold water, hot water. Insoluble in methanol, diethyl ether, n-octanol.

Section 10: Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Incompatible materials

Incompatibility with various substances: Reactive with organic materials, acids, moisture.

Corrosivity: Not available.

Special Remarks on Reactivity:

Absorbs CO₂ from air. Reacts with fluorine to evolve much heat and some light. Reacts with water. Addition of water to Quicklime has generated temperatures as high as 800 C. Some reports describe the reaction as violent. In water, calcium oxide forms calcium hydroxide generating a large quantity of heat. Ignition of sulfur, gunpowder, wood, and straw by heat of Quicklime-water reaction has been reported. Liquid hydrofluoric acid and calcium oxide react very violently. Calcium reacts with phosphorous pentoxide extremely violently when initiated by local heating. Lime becomes incandescent when heated to near its melting point (2500 C).

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Section 11: Toxicological Information

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:

LD₅₀: Not available. LC₅₀: Not available.

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans:

Very hazardous in case of skin contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (corrosive, permeator), of eye contact (corrosive).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:

Acute Potential Health Effects: Skin: Causes skin irritation and burns. Eyes: Causes eye irritation and burns. Inhalation: Material is irritating to respiratory tract and mucous membranes and upper respiratory tract. Ingestion: May be harmful if swallowed. Irritates gastrointestinal tract with possible burns. Swallowing may become painful, and difficult. A burning pain extends down the esophagus to the stomach. May affect respiration. Vomitus is thick and slimy due to mucous. Later it may contain blood shed of mucous membrane due to necrosis.

Section 12: Ecological Information

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The product itself and its products of degradation are not toxic.

Special Remarks on the Products of Biodegradation: Not available.

Section 13: Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Section 14: Transport Information

DOT Classification: Class 8: Corrosive material

Identification: : Calcium Oxide UNNA: 1910 PG: III

Special Provisions for Transport: Not available.

Section 15: Other Regulatory Information

Federal and State Regulations:

Connecticut hazardous material survey.: Calcium oxide Illinois toxic substances disclosure to employee act: Calcium oxide Rhode Island RTK hazardous substances: Calcium oxide Pennsylvania RTK: Calcium oxide Minnesota: Calcium oxide Massachusetts RTK: Calcium oxide California Director's List of Hazardous Substances: Calcium oxide TSCA 8(b) inventory: Calcium oxide TSCA 8(a) chemical risk rules: Calcium oxide

Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200). EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada): CLASS E: Corrosive solid.

DSCL (EEC):

R38- Irritating to skin. R41- Risk of serious damage to eyes. S2- Keep out of the reach of children. S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S39- Wear eye/face protection. S46- If swallowed, seek medical advice immediately and show this container or label.

HMIS (U.S.A.):

Health Hazard: 3

Fire Hazard: 0

Reactivity: 2

Personal Protection: j

National Fire Protection Association (U.S.A.):

Health: 3

Flammability: 0

Reactivity: 2

Specific hazard:

Protective Equipment:

Gloves. Synthetic apron. Vapor and dust respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate. Splash goggles.

Section 16: Other Information**References:**

-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -Material safety data sheet emitted by: la Commission de la Sant  et de la S curit  du Travail du Qu bec. -SAX, N.I. Dangerous Properties of Industrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II. -Guide de la loi et du r glement sur le transport des marchandises dangereuses au Canada. Centre de conformit  international Lt e. 1986.

Other Special Considerations: Not available.

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Manganese Oxide MnO



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MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

Manufacturer/Supplier:

ESPI Metals

1050 Benson Way, Ashland, OR 97520

Toll Free (800) 638-2581 * Fax (541) 488-8313

E-Mail: sales@espimetals.com

Product Name: Manganese Oxide

Formula: MnO

CAS Number: 1344-43-0

II. HAZARDOUS INGREDIENTS

Hazardous Components: Manganese Oxide

Percent (%): 0-100

OSHA PEL: 5 mg (Mn)/m³

ACGIH TLV: 0.2 mg (Mn)/m³

HMIS Ratings:

Health: 1

Flammability: 0

Reactivity: 0

III. PHYSICAL DATA

Boiling Point: N/E

Melting Point: N/E

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541.488.8313 fax
800.488.0060 toll-free fax

sales@espimetals.com

Precious Metal Prices

Jan 13, 2014 at 06:25 New York				
	Price	Change	High	
Gold	1245.80	-2.80	1253.30	
Silver	20.03	-0.14	20.36	
Platinum	1432.00	+0.00	1447.00	
Palladium	735.00	-7.00	749.00	

Specific Gravity: 5.43 -5.46 g/cc
Solubility in H₂O: Insoluble
Appearance and Odor: Green powder, no odor.

IV. FIRE AND EXPLOSION HAZARDS DATA

Flash Point: N/A

Autoignition Temperature: N/E

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

Extinguishing Media: Use suitable extinguishing media for surrounding material and type of fire.

Special Fire Fighting Procedures: Firefighters must wear full face, self contained breathing apparatus and full protective clothing to prevent contact with skin and eyes.

Unusual Fire & Explosion Hazards: None known

V. HEALTH HAZARD INFORMATION

Health Hazards:

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

Some manganese compounds are experimental tumorigens. They can cause central nervous 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 dusts of 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).

Acute Effects:

Inhalation: May cause irritation of the respiratory tract and mucous membranes, increase the incidence of upper respiratory tract and pulmonary infections. May cause metal fume fever. May also cause emphysema and acute pulmonary edema.

Ingestion: Absorption of manganese compounds from the gastrointestinal tract is poor under normal conditions. May cause abdominal pain and nausea.

Skin: May cause irritation.

Eye: May cause irritation.

Chronic Effects:

Inhalation: May cause pulmonary pneumonitis, manganism (psychosis and neurological disorders affecting the central nervous system).

Ingestion: May cause manganism.

Skin: May cause dermatitis.

Eye: May cause conjunctivitis.

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

Medical Conditions Generally Aggravated By Exposure: Pre-existing respiratory disorders.

Carcinogenicity: NTP: No **IARC:** No **OSHA:** No

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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

Conditions to Avoid: No data

Incompatibility (Material to Avoid): Strong oxidizing agents

Hazardous Decomposition Products: Manganese fume

Hazardous Polymerization: Will not occur

VII. SPILL OR LEAK PROCEDURES

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. Sweep or 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 all Local, State and Federal regulations.

VIII. SPECIAL PROTECTION INFORMATION

Respiratory Protection: NIOSH-approved dust respirator.

Ventilation: Use local exhaust to maintain concentration at or below the PEL, TLV. Mechanical exhaust is not recommended.

Eye Protection: Safety glasses

Protective Gloves: Impervious gloves

Other Protective Clothing or Equipment: Protective gear suitable to prevent contamination.

IX. SPECIAL PRECAUTIONS

Precautions to Be Taken in Handling and Storage: Keep container tightly sealed. Store in cool, dry place in tightly closed containers. Ensure good ventilation at the workplace.

Work 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. Maintain eyewash capable of sustained flushing, safety drench shower and facilities for washing.

TSCA Listed: Yes

DOT Regulations:

Hazard Class: None

The above information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. ESPI shall not be held liable for any damage resulting from handling or from contact with the above product.

Issued by: S. Dierks

Revised/Verified: August 2011

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Manganese Oxide MnO₂



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MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

Manufacturer/Supplier:

ESPI Metals

1050 Benson Way, Ashland, OR 97520

Toll Free (800) 638-2581 * Fax (541) 488-8313

E-Mail: sales@espimetals.com

Product Name: Manganese Oxide (Manganese IV Oxide)

Formula: MnO₂

CAS Number: 1313-13-9

II. HAZARDOUS INGREDIENTS

Hazardous Components: Manganese Oxide

Percent (%): 0-100

OSHA PEL: 5 mg (Mn)/m³

ACGIH TLV: 0.2 mg (Mn)/m³

HMIS Ratings:

Health: 1

Flammability: 0

Reactivity: 2

III. PHYSICAL DATA

Boiling Point: N/E

Melting Point: 535 °C

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Precious Metal Prices

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	Price	Change	High	
Gold	▼ 1245.80	-2.80	1253.30	
Silver	▼ 20.00	-0.17	20.36	
Platinum	▼ 1431.00	-1.00	1447.00	
Palladium	▼ 735.00	-7.00	749.00	

Specific Gravity: 5.026 g/cc
Solubility in H₂O: Insoluble
Appearance and Odor: Black powder, no odor.

IV. FIRE AND EXPLOSION HAZARDS DATA

Flash Point: N/A

Autoignition Temperature: N/E

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

Extinguishing Media: Use suitable extinguishing media for surrounding material and type of fire.

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: This substance is an oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Promotes fire.

V. HEALTH HAZARD INFORMATION

Health Hazards:

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

Some manganese compounds are experimental tumorigens. They can cause central nervous 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 dusts of 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).

Acute Effects:

Inhalation: May cause irritation of the respiratory tract and mucous membranes, increase the incidence of upper respiratory tract and pulmonary infections. May cause metal fume fever. May also cause emphysema and acute pulmonary edema.

Ingestion: Absorption of manganese compounds from the gastrointestinal tract is poor under normal conditions. May cause abdominal pain and nausea.

Skin: May cause irritation.

Eye: May cause irritation.

Chronic Effects:

Inhalation: May cause pulmonary pneumonitis, manganism (psychosis and neurological disorders effecting the central nervous system).

Ingestion: May cause manganism.

Skin: May cause dermatitis.

Eye: May cause conjunctivitis.

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

Carcinogenicity: NTP: No **IARC:** No **OSHA:** No

EMERGENCY AND FIRST AID PROCEDURES:

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

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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

Conditions to Avoid: No data

Incompatibility (Material to Avoid): Reducing agents, easily oxidized materials, organic materials, acids, aluminum powder, interhalogens.

Hazardous Decomposition Products: Toxic metal oxide fumes.

Hazardous Polymerization: Will not occur

VII. SPILL OR LEAK PROCEDURES

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. Scoop up or 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: Dispose of in accordance with Federal, State and Local regulations.

VIII. SPECIAL PROTECTION INFORMATION

Respiratory Protection: NIOSH approved respirator.

Ventilation: Use local exhaust to maintain concentration at or below the PEL, TLV. Mechanical exhaust is not recommended.

Eye Protection: Safety glasses

Protective Gloves: Impervious gloves

Other Protective Equipment: Protective gear suitable to prevent contamination.

IX. SPECIAL PRECAUTIONS

Precautions to Be Taken in Handling and Storage: Keep container tightly sealed. Store in cool, dry place in tightly closed containers. Minimize dust generation and accumulation. Ensure good ventilation at the workplace.

Work 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. Maintain eyewash capable of sustained flushing, safety drench shower and facilities for washing.

TSCA Listed: Yes

DOT Regulations:

Hazard Class: None

The above information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. ESPI shall not be held liable for any damage resulting from handling or from contact with the above product.

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Revised/Verified: August 2011

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Manganese Oxide Mn₂O₃



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ESPI Metals

1050 Benson Way, Ashland, OR 97520

Toll Free (800) 638-2581 * Fax (541) 488-8313

E-Mail: sales@espimetals.com

Product Name: Manganese Oxide (Manganese III Oxide)

Formula: Mn₂O₃

CAS Number: 1317-34-6

II. HAZARDOUS INGREDIENTS

Hazardous Components: Manganese Oxide

Percent (%): 0-100

OSHA PEL: 5 mg (Mn)/m³

ACGIH TLV: 0.2 mg (Mn)/m³

HMIS Ratings:

Health: 1

Flammability: 0

Reactivity: 0

III. PHYSICAL DATA

Boiling Point: N/E

Melting Point: N/E

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Precious Metal Prices

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Gold	1245.80	-2.80	1253.30	
Silver	20.03	-0.14	20.36	
Platinum	1432.00	+0.00	1447.00	
Palladium	735.00	-7.00	749.00	

Specific Gravity: 4.50 gm/cc
Solubility in H₂O: Insoluble
Appearance and Odor: Black crystalline powder

IV. FIRE AND EXPLOSION HAZARDS DATA

Flash Point: N/A

Autoignition Temperature: N/A

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

Extinguishing Media: Use suitable extinguishing media for surrounding material and type of fire.

Special Fire Fighting Procedures: Firefighters must wear full face, self-contained breathing apparatus and full protective clothing to prevent contact with skin and eyes.

Unusual Fire & Explosion Hazards: May emit toxic fumes when heated to decomposition.

V. HEALTH HAZARD INFORMATION

Health Hazards:

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

Some manganese compounds are experimental tumorigens. They can cause central nervous 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 dusts of 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).

Acute Effects:

Inhalation: May cause irritation of the respiratory tract and mucous membranes, increase the incidence of upper respiratory tract and pulmonary infections. May cause metal fume fever. May also cause emphysema and acute pulmonary edema.

Ingestion: Absorption of manganese compounds from the gastrointestinal tract is poor under normal conditions. May cause abdominal pain and nausea.

Skin: May cause irritation.

Eye: May cause irritation.

Chronic Effects:

Inhalation: May cause pulmonary pneumonitis, manganism (psychosis and neurological disorders effecting the central nervous system).

Ingestion: None recorded.

Skin: May cause dermatitis.

Eye: May cause conjunctivitis.

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

Carcinogenicity: NTP: No **IARC:** No **OSHA:** No

EMERGENCY AND FIRST AID PROCEDURES:

INHALATION: Remove victim to fresh air, keep warm and quiet, give oxygen if breathing is difficult and seek

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medical attention.

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

Conditions to Avoid: No data

Incompatibility (Material to Avoid): Strong oxidizing agents.

Hazardous Decomposition Products: Manganese fume.

Hazardous Polymerization: Will not occur

VII. SPILL OR LEAK PROCEDURES

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. Use non-sparking tools.

Waste Disposal Method: Dispose of in accordance with Federal, State and Local regulations.

VIII. SPECIAL PROTECTION INFORMATION

Respiratory Protection: NIOSH-approved dust respirator.

Ventilation: Use local exhaust to maintain concentration at or below the PEL, TLV. Mechanical exhaust is not recommended.

Eye Protection: Safety glasses

Protective Gloves: Impervious gloves.

Other Protective Clothing or Equipment: Protective gear suitable to prevent contamination.

IX. SPECIAL PRECAUTIONS

Precautions to Be Taken in Handling and Storage: Keep container tightly sealed. Store in cool, dry place in tightly closed containers. Ensure good ventilation at the workplace.

Work 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. Maintain eyewash capable of sustained flushing, safety drench shower and facilities for washing.

TSCA Listed: Yes

DOT Regulations:

Hazard Class: None

The above information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. ESPI shall not be held liable for any damage resulting from handling or from contact with the above product.

Issued By: S. Dierks

Revised/Verified: August 2011

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Manganese Oxide Mn3O4



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OFFLINE

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION

Manufacturer/Supplier:

ESPI Metals

1050 Benson Way, Ashland, OR 97520

Toll Free (800) 638-2581 * Fax (541) 488-8313

E-Mail: sales@espimetals.com

Product Name: Manganese Oxide

Formula: Mn₃O₄ (plus MnO)

CAS Number: 1317-35-7

II. HAZARDOUS INGREDIENTS

Hazardous Components: Manganese Oxide

Percent (%): 0-100

OSHA PEL: 5 mg(Mn)/m³

ACGIH TLV: 0.2 mg(Mn)/m³

III. PHYSICAL DATA

Boiling Point: N/E

Melting Point: 1564 °C

Specific Gravity: 4.856 g/cc

Solubility in H₂O: Insoluble

Appearance and Odor: Black crystalline powder and pieces, no odor.

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Contact

ESPI Metals

1050 Benson Way
Ashland, Oregon 97520

541.488.8311 telephone
800.638.2581 toll-free

541.488.8313 fax
800.488.0060 toll-free fax

sales@espimetals.com

Precious Metal Prices

Jan 13, 2014 at 06:25 New York				
	Price	Change	High	
Gold	1245.80	-2.80	1253.30	
Silver	20.03	-0.14	20.36	
Platinum	1432.00	+0.00	1447.00	
Palladium	735.00	-7.00	749.00	

IV. FIRE AND EXPLOSION HAZARDS DATA

Flash Point: N/A

Autoignition Temperature: N/E

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

Extinguishing Media: Use suitable extinguishing media for surrounding material and type of fire.

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: When heated to decomposition this material may emit toxic fumes.

V. HEALTH HAZARD INFORMATION

Effects of Exposure:

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

Some manganese compounds are experimental tumorigens. They 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 dusts of 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).

Acute Effects:

Inhalation: 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.

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

Skin: Absorption by skin is poor.

Eye: May cause moderate irritation.

Chronic Effects:

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

Ingestion: No chronic effects recorded.

Skin: No chronic effects recorded.

Eye: No chronic effects recorded.

Routes of Entry: Inhalation

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

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.

Carcinogenicity: NTP: No **IARC:** No **OSHA:** No

EMERGENCY AND FIRST AID PROCEDURES:

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

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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

Conditions to Avoid: None

Incompatibility (Material to Avoid): Easily oxidized materials and reducing agents.

Hazardous Decomposition Products: Manganese oxide fume.

Hazardous Polymerization: Will not occur

VII. SPILL OR LEAK PROCEDURES

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 Local, State and Federal regulations.

VIII. SPECIAL PROTECTION INFORMATION

Respiratory Protection: NIOSH approved dust respirator.

Ventilation: Use local exhaust to maintain concentration at or below the PEL, TLV. Mechanical exhaust is not recommended.

Eye Protection: Safety glasses

Protective Gloves: Rubber gloves

Other Protective Equipment: For long periods of exposure, wear protective clothing.

IX. SPECIAL PRECAUTIONS

Precautions to Be Taken in Handling and Storage: Keep container tightly sealed. Store in cool, dry place in tightly closed containers. Avoid breathing dust and use adequate ventilation. Store away from oxidizers. Wash thoroughly after handling.

Work 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. Maintain eyewash capable of sustained flushing, safety drench shower and facilities for washing.

TSCA Listed: Yes

Dot Regulations:

Hazard Class: None

The above information is believed to be correct, but does not purport to be all inclusive and shall be used only as a guide. ESPI shall not be held liable for any damage resulting from handling or from contact with the above product.

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