

MATERIAL SAFETY DATA SHEET

I PRODUCT IDENTIFICATION

Trade Name: Nickel Oxide **Chemical Family:** Metal Oxide
Formula: NiO **CAS #:** 1313-99-1
Synonyms: Nickel monoxide, natural bunsenite, green nickel oxide, nickelous oxide, nickel (III) oxide.

II HAZARDOUS INGREDIENTS

<u>Hazardous Components</u>	<u>%</u>	<u>OSHA/PEL</u>	<u>ACGIH/TLV</u>	<u>Sec. 302</u>	<u>Sec. 304</u>	<u>Sec. 313</u>
Nickel Oxide	0-100	1 mg (Ni)/m ³	1 mg (Ni)/m ³	No		Yes 1 lb Yes

HMIS Ratings (0-4): Health: 3 Flammability: 0 Reactivity: 0
HMIS Protective Equipment: H: glasses, gloves, clothing, combo resp.

III PHYSICAL DATA

Boiling Point:	N/E or N/A	Melting Point:	1984 °C
Vapor Pressure:	N/E	Specific Gravity (H₂O = 1):	6.57 gm/cc
Vapor Density:	N/A	Solubility in H₂O:	Insoluble
% Volatile:	N/E or N/A	Evaporation Rate:	N/A
Appearance and Odor:	Green-black powder, no odor; turns yellow when hot.		

IV FIRE AND EXPLOSION HAZARD DATA

Flash Point: N/E or N/A **Method Used:** Non-flammable
Explosive Limits: Upper: N/A Lower: N/A **Autoignition Temperature:** N/E or N/A

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

Special Firefighting 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: Nickel may emit toxic fumes if involved in a fire. May react violently with fluorine, hydrogen peroxide, hydrogen sulfide, iodine, barium peroxide + air.

V HEALTH HAZARD INFORMATION

Effects of Exposure:

Nickel is a confirmed carcinogen with experimental carcinogenic, neoplastigenic, tumorigenic and teratogenic data, and is a poison by ingestion, intratracheal, intraperitoneal, subcutaneous and intravenous routes. An experimental teratogen. Ingestion of soluble salts causes nausea, vomiting and diarrhea. Hypersensitivity to nickel is common and can cause allergic contact dermatitis, pulmonary asthma, conjunctivitis and inflammatory reactions around nickel-containing medical implants and prosthesis. Cancer develops in rodents after administration of Ni₃S₂, NiO or Ni (Co₄). Pulmonary damage develops in rodents chronically exposed to aerosols of nickel dust, NiO₂ or NiO. (Sax, Dangerous Properties of Industrial Materials, eighth edition.)

Acute Effects:

Inhalation: May cause irritation to the upper respiratory tract, mucous membranes and nasal cavities. May cause pulmonary asthma attacks.

Ingestion: Nickel is poison by ingestion. Large doses may cause intestinal disorders, convulsions and asphyxia.

Skin: May cause irritation.

Eye: May cause irritation.

Chronic Effects:

Inhalation: Prolonged or repeated inhalation may cause pneumonitis.

Ingestion: May cause nickel toxicity.

Skin: May sensitize the skin (nickel itch). May cause allergic dermatitis, eczematous dermatitis and may be accompanied a week later with superficial skin ulcers, which may discharge and become crusted.

Eye: May cause conjunctivitis.

Routes of Entry: Inhalation, ingestion, skin and eyes.

Target Organs: May affect the nasal cavities, respiratory system, lungs, blood and skin.

Medical Conditions Generally Aggravated by Exposure: Pre-existing respiratory disorders, pulmonary functions, asthma and skin disorders.

Carcinogenicity: NTP: Yes IARC: Yes OSHA: Yes

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.

INGESTION: Give 1-2 glasses of milk or water and induce vomiting, seek medical attention immediately. 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, seek medical attention if symptoms persist.

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

VI REACTIVITY DATA

Stability: Stable

Conditions to Avoid: None

Incompatibility (Materials to Avoid): Fluorine, hydrogen peroxide, hydrogen sulfide, iodine, barium peroxide + air.

Hazardous Decomposition Products: Nickel and its oxides.

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 and 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 Local, State and Federal regulations.

VIII SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type): NIOSH approved dust-mist-vapor respirator.

Ventilation: Use local exhaust to maintain concentration at or below the PEL, TLV. Handle in a controlled environment when in dust or powder form. General exhaust is not recommended.

Protective Gloves: Rubber gloves.

Eye Protection: Safety glasses.

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

IX SPECIAL PRECAUTIONS

Precautions to Be Taken in Handling and Storage: Store in a tightly sealed container in a cool, dry area. Wash thoroughly after handling.

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.

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).

Issued by: S. Dierks
Dated: June 1994