

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
150 Allen Road Suite 302
Basking Ridge, New Jersey 07920
Information: 1-800-416-2505

Emergency Contact:
CHEMTREC 1-800-424-9300
Calls Originating Outside the US:
703-527-3887 (Collect Calls Accepted)

SUBSTANCE: NICKEL CARBONYL

TRADE NAMES/SYNONYMS:

MTG MSDS 128; NICKEL TETRACARBONYL; NICKEL SPONGE; CARBONYL NICKEL POWDER; TETRACARBONYL NICKEL; RCRA P037; UN 1259; C4NiO4; MAT16290; RTECS QR6300000

CHEMICAL FAMILY: carbonyls

CREATION DATE: Jan 24 1989

REVISION DATE: Dec 11 2008

2. COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: NICKEL CARBONYL
CAS NUMBER: 13463-39-3
PERCENTAGE: 100

3. HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=4 FIRE=3 REACTIVITY=3



EMERGENCY OVERVIEW:

COLOR: colorless

PHYSICAL FORM: volatile liquid

ODOR: damp, moldy odor

MAJOR HEALTH HAZARDS: potentially fatal if inhaled, allergic reactions, cancer hazard (in humans)

PHYSICAL HAZARDS: May explode if exposed to shock, friction or heating. Finely divided material may explode spontaneously. Extremely flammable liquid and vapor. Vapor may cause flash fire. May decompose violently on heating. May decompose on contact with air.

POTENTIAL HEALTH EFFECTS:

INHALATION:

SHORT TERM EXPOSURE: cough, fever, nausea, vomiting, diarrhea, chest pain, difficulty breathing, irregular heartbeat, headache, dizziness, disorientation, bluish skin color, blood disorders, liver enlargement, convulsions, death

LONG TERM EXPOSURE: reproductive effects, cancer

SKIN CONTACT:

SHORT TERM EXPOSURE: irritation, allergic reactions, rash, itching

LONG TERM EXPOSURE: irritation, allergic reactions

EYE CONTACT:

SHORT TERM EXPOSURE: irritation

LONG TERM EXPOSURE: no information is available

INGESTION:

SHORT TERM EXPOSURE: fever, nausea, vomiting, difficulty breathing, irregular heartbeat, headache, dizziness, bluish skin color

LONG TERM EXPOSURE: no information is available

4. FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: If vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

ANTIDOTE: dimercaprol/oil, intramuscular.

NOTE TO PHYSICIAN: For inhalation, consider oxygen. For ingestion, consider gastric lavage. Consider oxygen.

5. FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Severe fire hazard. Severe explosion hazard. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Vapor/air mixtures are explosive.

EXTINGUISHING MEDIA: alcohol-resistant foam, carbon dioxide, regular dry chemical, water

Large fires: Use alcohol-resistant foam or flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Dike for later disposal. Do not scatter spilled material with high-pressure water streams. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Do not scatter spilled material with high-pressure water streams. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

FLASH POINT: <-4 F (<-20 C) (CC)

LOWER FLAMMABLE LIMIT: 2%

AUTOIGNITION: <392 F (<200 C)

FLAMMABILITY CLASS (OSHA): IB

HAZARDOUS COMBUSTION PRODUCTS:

Thermal decomposition or combustion products: oxides of carbon, oxides of nickel

6. ACCIDENTAL RELEASE MEASURES

WATER RELEASE:

Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.

OCCUPATIONAL RELEASE:

Avoid heat, flames, sparks and other sources of ignition. Do not touch spilled material. Stop leak if possible without personal risk. Reduce vapors with water spray. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

7. HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Protect from physical damage. Avoid heat, flames, sparks and other sources of ignition. Subject to storage regulations: U.S. OSHA 29 CFR 1910.106. Grounding and bonding required. Notify State Emergency Response Commission for storage or use at amounts greater than or equal to the TPQ (U.S. EPA SARA Section 302). SARA Section 303 requires facilities storing a material with a TPQ to participate in local emergency response planning (U.S. EPA 40 CFR 355 Part B). Keep separated from incompatible substances.

HANDLING: Subject to handling regulations: U.S. OSHA 29 CFR 1910.119.

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:

NICKEL CARBONYL:

0.001 ppm(Ni) (0.007 mg/m³) OSHA TWA

0.05 ppm(Ni) ACGIH TWA

0.001 ppm (0.007 mg/m³) NIOSH recommended TWA 10 hour(s)

VENTILATION: Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles with a faceshield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

At any detectable concentration -

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Escape -

Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern.

Any appropriate escape-type, self-contained breathing apparatus.

For Unknown Concentrations or Immediately Dangerous to Life or Health -

Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid
COLOR: colorless
PHYSICAL FORM: volatile liquid
ODOR: damp, moldy odor
MOLECULAR WEIGHT: 170.75
MOLECULAR FORMULA: C₄-Ni-O₄
BOILING POINT: 109 F (43 C)
FREEZING POINT: -13 F (-25 C)
VAPOR PRESSURE: 400 mmHg @ 26 C
VAPOR DENSITY (air=1): 5.98 @ 43 C
SPECIFIC GRAVITY (water=1): 1.3 @ 17 C
WATER SOLUBILITY: 0.018% @ 10 C
PH: Not available
VOLATILITY: Not available
ODOR THRESHOLD: 1-3 ppm
EVAPORATION RATE: Not available
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available
SOLVENT SOLUBILITY:
Soluble: alcohol, benzene, chloroform, acetone, ethanol, carbon tetrachloride, nitric acid
Insoluble: dilute acids, dilute alkali

10. STABILITY AND REACTIVITY

REACTIVITY: Finely divided material may explode spontaneously. May decompose on contact with air. May decompose violently on heating.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Avoid inhalation of material or combustion by-products. Keep out of water supplies and sewers.

INCOMPATIBILITIES: halogens, oxidizing materials, halo carbons, combustible materials

HAZARDOUS DECOMPOSITION:

Decomposition products on contact with acids: oxides of carbon

Thermal decomposition or combustion products: oxides of carbon, oxides of nickel

Thermal decomposition products: oxides of carbon, oxides of nickel

POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION

NICKEL CARBONYL:

TOXICITY DATA: 35 ppm/30 minute(s) inhalation-rat LC50

CARCINOGEN STATUS: NTP: Known Human Carcinogen (Soluble and insoluble nickel compounds);

IARC: Human Sufficient Evidence, Animal Limited Evidence, Group 1 (Nickel and nickel compounds); EC: Category 3

ACUTE TOXICITY LEVEL:

Highly Toxic: inhalation

TARGET ORGANS: immune system (sensitizer)

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: immune system disorders or allergies, respiratory disorders, skin disorders and allergies

TUMORIGENIC DATA: Available.

REPRODUCTIVE EFFECTS DATA: Available.

ADDITIONAL DATA: May cross the placenta. May be excreted in breast milk.

12. ECOLOGICAL INFORMATION

FATE AND TRANSPORT:

KOW: 191866.87 (log = 5.287) (estimated from water solubility)

KOC: 40086.67 (log = 4.609) (estimated from water solubility)

HENRY'S LAW CONSTANT: 5 E -1 atm-m³/mol

BIOCONCENTRATION: 32.43 (estimated from water solubility)

AQUATIC PROCESSES: 3.3896593 hours (River Model: 1 m deep, 1 m/s flow, 3 m/s wind)

ENVIRONMENTAL SUMMARY: Relatively non-persistent in the environment. Not expected to leach through the soil or the sediment. Accumulates very little in the bodies of living organisms. Highly volatile from water.

13. DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): P037.

14. TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Nickel carbonyl

ID NUMBER: UN1259

HAZARD CLASS OR DIVISION: 6.1

PACKING GROUP: I

LABELING REQUIREMENTS: 6.1; 3

QUANTITY LIMITATIONS:

PASSENGER AIRCRAFT OR RAILCAR: Forbidden



CARGO AIRCRAFT ONLY: Forbidden
MARINE POLLUTANT: NICKEL CARBONYL

CANADIAN TRANSPORTATION OF DANGEROUS GOODS:

SHIPPING NAME: Nickel carbonyl

UN NUMBER: UN1259

CLASS: 6.1; 3

PACKING GROUP/CATEGORY: I

15. REGULATORY INFORMATION

U.S. REGULATIONS:

CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):

NICKEL CARBONYL (as Ni): 10 LBS RQ

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart B):

NICKEL CARBONYL (as Ni): 1 LBS TPQ

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355 Subpart C):

NICKEL CARBONYL (as Ni): 10 LBS RQ

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370 Subparts B and C):

ACUTE: Yes

CHRONIC: Yes

FIRE: Yes

REACTIVE: Yes

SUDDEN RELEASE: Yes

SARA TITLE III SECTION 313 (40 CFR 372.65):

NICKEL CARBONYL (as Ni)

OSHA PROCESS SAFETY (29 CFR 1910.119):

NICKEL CARBONYL (as Ni): 150 LBS TQ

STATE REGULATIONS:

California Proposition 65:

Known to the state of California to cause the following:

NICKEL CARBONYL (as Ni)

Cancer (Oct 01, 1987)

Developmental toxicity (Sep 01, 1996)

CANADIAN REGULATIONS:

WHMIS CLASSIFICATION: B2, D1A, D2A.

NATIONAL INVENTORY STATUS:

U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.

16. OTHER INFORMATION

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