

Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name: Corrosive solid, acidic, inorganic, n.o.s. (Niobium pentachloride) (MSDS No. P-19-6409)	Trade Names: Not applicable.
Chemical Name: Niobium pentachloride	Synonyms: Columbium pentachloride
Chemical Family: Metal halide	Product Grades: None assigned.
Telephone:	Company Name: Praxair, Inc.
Emergencies: 1-800-645-4633*	39 Old Ridgebury Road
CHEMTREC: 1-800-424-9300*	Danbury, CT 06810-5113
Routine: 1-800-PRAXAIR	

*Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier, Praxair sales representative, or call 1-800-PRAXAIR (1-800-772-9247).

2. Hazards Identification

EMERGENCY OVERVIEW

DANGER! Corrosive solid.

May be harmful if inhaled, ingested, or absorbed through the skin.

May burn skin, eyes, respiratory tract, and mucous membranes.

Reacts with water and moisture in the air to form corrosive by-products.

Self-contained breathing apparatus and protective clothing

must be worn by rescue workers.

Under ambient conditions, this is a pale yellow solid with a pungent odor.

OSHA REGULATORY STATUS: This material is considered hazardous by the OSHA Hazard Communications Standard (29 CFR 1910.1200).

POTENTIAL HEALTH EFFECTS:

Effects of a Single (Acute) Overexposure

Inhalation. Vapors may burn tissues of the mouth, nose, and respiratory tract and may cause coughing and shortness of breath.

Skin Contact. May burn the skin.

Swallowing. Harmful if ingested.

Eye Contact. May burn the eyes.

Effects of Repeated (Chronic) Overexposure. Repeated or prolonged exposure of the skin may cause dermatitis (inflammation of the skin).

Other Effects of Overexposure. None known.

Medical Conditions Aggravated by Overexposure. The irritating/burning properties of Niobium pentachloride may aggravate an existing dermatitis. Respiratory irritation/burning may aggravate an existing asthma or other upper respiratory or pulmonary disease.

CARCINOGENICITY: Niobium pentachloride is not listed by NTP, OSHA, or IARC.

POTENTIAL ENVIRONMENTAL EFFECTS: None known.

3. Composition/Information on Ingredients

See section 16 for important information about mixtures.

COMPONENT	CAS NUMBER	CONCENTRATION
Niobium pentachloride <i>*The symbol > means "greater than."</i>	10026-12-7	>99%*

4. First Aid Measures

INHALATION: Immediately remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

SKIN CONTACT: Remove contaminated clothing and shoes, and wash exposed areas with soap and plenty of water. Wash contaminated clothing before reuse; discard shoes. Seek medical attention if discomfort persists.

SWALLOWING: Keep the victim calm, and get immediate medical aid. If conscious, the victim may be given water. Do not induce vomiting unless directed to do so by medical personnel.

EYE CONTACT: Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are thoroughly flushed. Immediately see a physician, preferably an ophthalmologist.

NOTES TO PHYSICIAN: *There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.*

5. Fire Fighting Measures

FLAMMABLE PROPERTIES: This material is nonflammable.

SUITABLE EXTINGUISHING MEDIA: Use appropriate media for surrounding fire.

PRODUCTS OF COMBUSTION: Not applicable. See section 10 for possible products of thermal decomposition.

PROTECTION OF FIREFIGHTERS: DANGER! Corrosive solid. Evacuate all personnel from the danger area. Use self-contained breathing apparatus and protective clothing. Remove ignition sources if without risk. Move containers away from the fire area if without risk. If this material is on fire, extinguish flames with the recommended media. On-site fire brigades must comply with OSHA 29 CFR 1910.156.

Specific Physical and Chemical Hazards. Reacts with water and moisture in the air to form hydrogen chloride.

Protective Equipment and Precautions for Firefighters. Firefighters should wear self-contained breathing apparatus and full fire-fighting turnout gear.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

DANGER! Corrosive solid.

Personal Precautions. Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus and protective clothing. Remove all sources of ignition if without risk. Shut off flow if without risk. Reacts with water and moisture in the air to form corrosive by-products. Ventilate the area or move the container to a well-ventilated area.

Environmental Precautions. Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN HANDLING: Do not breathe vapor. Use only with adequate ventilation or respiratory protection. Do not get material in eyes, on skin, or on clothing. Have safety showers and eyewash fountains immediately available. Keep away from water, atmospheric moisture, strong acids, strong bases, and reducing agents. Use only in a closed system. Do not eat, drink, or smoke in areas where this material is stored or used. After working with this product, wash face and hands thoroughly with soap and water before eating drinking, smoking, applying cosmetics, or using the toilet. Protect containers from damage. For other precautions in using this product, see section 16.

PRECAUTIONS TO BE TAKEN IN STORAGE: Store and use with adequate ventilation. Store in a cool, dry area under a dry, inert atmosphere and away from direct sunlight. Store only in the DOT-approved container in which the product was received. Never store niobium pentachloride in open containers. Keep containers closed. Store only where temperature will not exceed 125°F (52°C).

8. Exposure Controls/Personal Protection

COMPONENT	OSHA PEL	ACGIH TLV-TWA (2010)
Niobium pentachloride	Not Established.	Not Established.

IDLH = Not available.

ENGINEERING CONTROLS:

Local Exhaust. Inadequate; see SPECIAL.

Mechanical (General). Inadequate; see SPECIAL.

Special. Use only in a closed system. This material is moisture-sensitive. It should be maintained under a dry, inert atmosphere and used in an enclosed device such as a glove box.

Other. See SPECIAL.

PERSONAL PROTECTIVE EQUIPMENT:

Skin Protection. Wear work gloves when handling containers; rubber where contact with product may occur. Protective clothing where needed. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133.

Eye/Face Protection. Wear safety glasses when handling containers. Select eye protection in accordance with OSHA 29 CFR 1910.133.

Respiratory Protection. A respiratory protection program that meet OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable) requirements must be followed

whenever workplace conditions warrant respirator use. Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure (e.g., an organic vapor cartridge). For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus.

9. Physical and Chemical Properties

APPEARANCE:	Yellow solid
ODOR:	Pungent
ODOR THRESHOLD:	Not available.
PHYSICAL STATE:	Solid at normal temperature and pressure
pH:	Not applicable.
MELTING POINT at 1 atm:	401°F (205°C)
BOILING POINT at 1 atm:	489°F (254°C)
FLASH POINT (test method):	Not applicable.
EVAPORATION RATE (Butyl Acetate = 1):	Not available.
FLAMMABILITY:	Nonflammable
FLAMMABLE LIMITS IN AIR , % by volume:	LOWER: Not applicable. UPPER: Not applicable.
VAPOR PRESSURE:	Sublimes at 257°F (125°C)
VAPOR DENSITY at 70°F (21.1°C) and 1 atm:	Not available.
SPECIFIC GRAVITY (H ₂ O = 1) at 19.4°F (-7°C):	2.75
SPECIFIC GRAVITY (Air = 1) at 70°F (21.1°C) and 1 atm:	Not available.
SOLUBILITY IN WATER 68°F (20°C):	Reacts
PARTITION COEFFICIENT: n-octanol/water:	Not available.
AUTOIGNITION TEMPERATURE:	Not available.
DECOMPOSITION TEMPERATURE:	Not available.
PERCENT VOLATILES BY VOLUME:	Not available.
MOLECULAR WEIGHT:	270.17
MOLECULAR FORMULA:	NbCl ₅

10. Stability and Reactivity

CHEMICAL STABILITY: Unstable Stable

CONDITIONS TO AVOID: Moisture, oxidizing agents.

INCOMPATIBLE MATERIALS: Air, moisture, strong acids or bases, reducing agents

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition may produce Niobium oxychloride and hydrogen chloride.

POSSIBILITY OF HAZARDOUS REACTIONS: May Occur Will Not Occur

Thermal decomposition may produce Niobium oxychloride and hydrogen chloride.

11. Toxicological Information

ACUTE DOSE EFFECTS: LD₅₀, 1 hr, oral, rat = 1400 mg/kg; LD₅₀, 1 hr, intraperitoneal, rat = 40 mg/kg

STUDY RESULTS: None known.

12. Ecological Information

ECOTOXICITY: No known effects.

OTHER ADVERSE EFFECTS: Niobium pentachloride does not contain any Class I or Class II ozone-depleting chemicals.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return container to supplier.

14. Transport Information

DOT/IMO SHIPPING NAME: Corrosive solid, acidic, inorganic, n.o.s. (Niobium pentachloride)

HAZARD CLASS:	PACKING GROUP/Zone:	IDENTIFICATION NUMBER:	PRODUCT RQ:
8	II	UN3260	None

SHIPPING LABEL(s): CORROSIVE

PLACARD (when required): CORROSIVE

MARINE POLLUTANTS: Niobium pentachloride is not listed as a marine pollutant by DOT.

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

U.S. FEDERAL REGULATIONS:

EPA (ENVIRONMENTAL PROTECTION AGENCY)

CERCLA: COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): None

SARA: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT:

SECTIONS 302/304: Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of Extremely Hazardous Substances (EHS) (40 CFR Part 355):

TPQ: None

EHS RQ (40 CFR 355): None

SECTIONS 311/312: Require submission of MSDSs and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows:

IMMEDIATE: Yes

DELAYED: No

PRESSURE: No

REACTIVITY: Yes

FIRE: No

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Niobium pentachloride is not subject to reporting under Section 313.

40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION: Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Niobium pentachloride is not listed as a regulated substance.

TSCA: TOXIC SUBSTANCES CONTROL ACT: Niobium pentachloride is listed on the TSCA inventory.

OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Niobium pentachloride is not listed in Appendix A as a highly hazardous chemical.

STATE REGULATIONS:

CALIFORNIA: Niobium pentachloride is not listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

PENNSYLVANIA: Niobium pentachloride is subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

16. Other Information

Read and understand all labels and instructions supplied with all containers of this product.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE: Corrosive solid. Use only with compatible materials and equipment.

Mixtures. When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Remember, chemicals have properties that can cause serious injury or death.

HAZARD RATING SYSTEMS:

NFPA RATINGS:

HEALTH = 3
FLAMMABILITY = 0
INSTABILITY = 2
SPECIAL = W

HMIS RATINGS:

HEALTH = 3
FLAMMABILITY = 0
PHYSICAL HAZARD = 2

NOTE: The hazards of this material have not been fully investigated.

Praxair asks users of this product to study this MSDS and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

Praxair MSDSs are furnished on sale or delivery by Praxair or the independent distributors and suppliers who package and sell our products. To obtain current MSDSs for these products, contact your Praxair sales representative or local distributor or supplier, or download from www.praxair.com. If you have questions regarding Praxair MSDSs, would like the form number and date of the latest MSDS, or would like the names of the Praxair suppliers in your area, phone or write the Praxair Call Center (**Phone:** 1-800-PRAXAIR; **Address:** Praxair Call Center, Praxair, Inc., PO Box 44, Tonawanda, NY 14151-0044).

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