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SAFETY DATA SHEET

Section 1. Identification

Product Name: Niobium tetraethoxy dimethylaminoethoxide

Product Type: Liquid

CAS Number: 359847-15-7

Product Number: NB7157

Recommended Use: Laboratory chemicals, synthesis of substances.

Uses Advised Against: This product is being supplied under the TSCA R&D Exemption (40 CFR Section 720.36). It is the recipient's responsibility to comply with the requirements of the R&D exemption. The product may not be used for a non-exempt commercial purpose under TSCA unless appropriate consent is granted in writing by Ereztech LLC.

Product Manufacturer: Ereztech LLC
11555 Medlock Bridge Road, Suite 100
Johns Creek, GA 30097

Product Information: (888) 658-1221

In Case of an Emergency: CHEMTREC: 1-800-424-9300 (USA);
+1 703-527-3887 (International); CCN836180
*** Contact manufacturer for all non-emergency calls.

Section 2. Hazards Identification

Appearance/Odor: Pale yellow liquid, odor not determined.

Classification:
ACUTE TOXICITY, ORAL – Category 5, H303
ACUTE TOXICITY, DERMAL – Category 5, H313
SKIN CORROSION/IRRITATION - Category 2, H315
SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2A, H319
ACUTE TOXICITY, INHALATION – Category 4, H332
SPECIFIC TARGET ORGAN TOXICITY, SINGLE EXPOSURE; RESPIRATORY TRACT IRRITATION – Category 3, H335

GHS Label Elements

Hazard Pictograms:

Section 2. Hazards Identification

Signal Word: WARNING

Hazard Statements:
H303: May be harmful if swallowed.
H313: May be harmful in contact with skin.
H315: Causes skin irritation.
H319: Causes serious eye irritation.
H332: Harmful if inhaled.
H335: May cause respiratory irritation.

Precautionary Statements

Prevention:
P261: Avoid breathing sprays/mists/vapors/gases.
P264 + P265: Wash hands and skin thoroughly after handling. Do not touch eyes.
P271: Use only outdoors or with adequate ventilation.
P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:
P301 + P317: IF SWALLOWED: Get medical help.
P302 + P317: IF ON SKIN: Get medical help.
P302 + P352: IF ON SKIN: Wash with plenty of water.
P304 + P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P319: Get medical help if you feel unwell.
P317: IF INHALED: Get medical help.
P332 + P317: If skin irritation occurs: Get medical help.
P337 + P317: If eye irritation persists: Get medical help.
P362 + P364: Take off contaminated clothing and wash it before reuse.

Storage:
P403 + P233: Store in a well ventilated place. Keep container tightly closed.
P405: Store locked up.

Disposal:
P501: Dispose of contents/container in accordance with federal, state and local regulations.

OSHA/HCS Status: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Hazards Not Otherwise Classified (HNOC): Reacts slowly with water to release ethanol and dimethylaminoethanol (DMAE). Overexposure to ethanol by skin absorption, inhalation or ingestion may have a narcotic effect (headache, nausea, drowsiness). Ethanol is metabolized to acetaldehyde and acetic acid which in large quantities cause metabolic acidosis, CNS depression and death due to respiratory arrest.

Section 3. Composition/Information on Ingredients

Substance Type : Mono-constituent.
Synonyms : Niobium tetraethoxide dimethylaminoetoxide; $Nb(OEt)_4(dmae)$; $Nb(OEt)_4(Me_2NCH_2CH_2O)$; NbTDMAE.
Formula : $C_{12}H_{30}NO_5Nb$
Molecular Weight : 361.28 g/mol.

Component Name	%	CAS Number
Niobium tetraethoxy dimethylaminoethoxide	≥ 97.5	359847-15-7

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First Aid Measures

Description of Necessary First Aid Measures

General Advice: Move out of dangerous area. Get emergency medical help immediately. Show this safety data sheet to the doctor in attendance. If unconscious, place in recovery position and get medical help immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Eye Contact: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses if easy to do. Continue rinsing. Get medical help if irritation develops and persists, if symptoms develop or if you feel unwell.

Skin Contact: Take off contaminated clothing and shoes immediately. Wash off contaminated skin with plenty of water. Get medical help if irritation develops and persists, if symptoms develop or if you feel unwell.

Inhalation: Get emergency medical help immediately. Rescuer should wear a mask or self-contained breathing apparatus if it is suspected that fumes or gases are still present. Remove person to fresh air and keep comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Do not use the mouth-to-mouth method of resuscitation if victim ingested or inhaled the product; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Ingestion: Get emergency medical help immediately. Rinse mouth, and then give water to drink (two glasses at most). Do NOT induce vomiting. Remove dentures if any. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person.

Section 4. First Aid Measures

Most Important Symptoms/Effects, Acute And Delayed Potential Acute Health Effects

Eye Contact: Causes eye irritation. Symptoms may include stinging, tearing, redness, swelling and blurred vision. Prolonged contact may cause temporary/permanent damage to eye tissues.

Inhalation: Compounds released when product is exposed to moisture/water may be expected to be corrosive to mucous membranes and tissues of the upper respiratory tract. Symptoms may include a burning sensation, coughing, coughing up blood (hemoptysis), wheezing, laryngitis, shortness of breath/ difficulty in breathing (dyspnea), blueness (cyanosis) of lips and skin, nausea, headaches, disorientation, general weakness and loss of consciousness.

Skin Contact: Skin contact with this product may be harmful and will cause irritation. Symptoms may include burning, itching and redness. Prolonged product contact may cause burns to exposed tissues resulting in blistering and tissue necrosis.

Ingestion: Compounds released when product is exposed to moisture/water may be expected to be corrosive to mucous membranes and tissues of the mouth, esophagus and digestive tract. Symptoms may include pain when swallowing (odynophagia), difficulty swallowing (dysphagia), fever, nausea, recurrent vomiting (emesis) and vomiting of blood (hematemesis). Severe burns which may be accompanied by perforation of the esophagus and stomach may present additional symptoms of abdominal pain/rigidity, chest and/or back pain.

Chronic Symptoms: On contact with water, this product produces ethanol which is known to have a chronic effect on the Central Nervous System (CNS).

Indication of Immediate Medical Attention and Special Treatment Needed, If Necessary

Notes to Physician: Treat symptomatically.

Specific Treatments: No specific treatment.

Protection of First Responders: No action taken shall be taken involving any personal risk without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

See Toxicological Information (Section 11)

Section 5. Fire Fighting Measures

General Hazards: Product reacts slowly with water to release ethanol and dimethylaminoethanol.

Suitable Extinguishing Media: THE MOST EFFECTIVE FIRE EXTINGUISHING AGENT IS DRY CHEMICAL POWDER PRESSURIZED WITH NITROGEN. Vermiculite, dry sand, dry chemical or carbon dioxide (CO_2) may also be used.

Unsuitable Extinguishing Media: DO NOT USE WATER OR FOAM as product reacts to produce extremely flammable vapors upon contact with water.

Section 5. Fire Fighting Measures

Unusual Fire and Explosion Hazards:

This material reacts slowly with water and compounds containing active hydrogen such as alcohols and acids to produce ethanol and dimethylaminoethanol. Product runoff to sewer may create a fire or explosion hazard. Ethanol and dimethylaminoethanol vapors/gases that are released from product hydrolysis are heavier than air and will spread along the ground. Vapors may accumulate in low or confined areas or travel a considerable distance to an ignition source and flashback.

Product of Combustion:

Carbon oxides (CO_x), niobium oxides, nitrogen oxides (NO_x). Irritating fumes and potentially harmful vapors may be generated during exposure to elevated temperatures or open flame.

Protection of Firefighters:

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Avoid contact with skin or eyes. Avoid the formation and inhalation of sprays, mists, vapors and gases.

Eliminate all local and distant ignition sources. Move containers from fire area if process can be accomplished without risk to firefighters. To reduce the possibility of explosion, use a water spray or fog to reduce direct vapors and to cool unopened containers. Do not cut, grind, drill or weld on or near product containers (even empty) of this product because an explosion may result.

Fire-fighters should wear appropriate protection equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in a positive pressure mode.

Section 6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures

For Non-Emergency Personnel:

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid the formation and inhalation of sprays, mists, vapors and gases. Provide adequate ventilation. Wear respiratory protection. Put on appropriate personal protective equipment.

Section 6. Accidental Release Measures

For Emergency Responders: If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For Non-Emergency Personnel".

Environmental Precautions: Do not allow dispersal of spilled material and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for Containment

General: Move containers from spill area if safe to do so. Avoid the formation and inhalation of sprays and mists. Dispose of collected spillage in accordance with federal, state and local regulations. Contaminated absorbent material may pose the same hazard as the spilled product.

Small Spill: Collect spillage with a dry, absorbent material (e.g. sand, earth, vermiculite or diatomaceous earth) and place in dry, sealed container for disposal.

Large Spill: Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with a dry, absorbent material (e.g. dry sand, vermiculite or diatomaceous earth) and place in dry, sealed container for disposal.

Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and Storage

Precautions: Product is air/moisture sensitive; handle under a dry, inert gas. Nitrogen with less than 5 ppm each of moisture and oxygen is recommended. Keep container tightly sealed. Avoid contact with skin, eyes and clothing. Avoid the formation and inhalation of sprays, mists, vapors and gases. Do not ingest. Avoid prolonged exposure. Ensure adequate ventilation.

Protective Measures: Put on appropriate personal protective equipment (see Section 8). Keep in the original container kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Section 7. Handling and Storage

General Occupational Hygiene: Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking or smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Safe Storage Conditions: Product is air/moisture sensitive; store under an inert gas. Nitrogen with less than 5 ppm each of moisture and oxygen is recommended. Store in original container protected from direct sunlight in a dry and well-ventilated area, away from incompatible materials noted above and food and drink. Keep container tightly closed and sealed until ready for use. Store locked up.

Section 8. Exposure Controls/Personal Protection

Introductory Remarks: These recommendations provide general guidance for handling this product. Because work environments and material handling practices vary, safety procedures should be developed for each intended application. While developing safe handling procedures, do not overlook the need to clean equipment and conduct regular repairs. Waste from these procedures should be handled in accordance with Section 13.

Occupational Exposure Limits: Product contains no substances with occupational exposure limit values.

Engineering Controls: Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute. Provide an eyewash/shower station.

Environmental Exposure Controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual Protection Measures

Hygiene Measures: Avoid all unnecessary exposure. Wash all exposed skin (hands, forearms and face) thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Remove all soiled and contaminated clothing immediately. Do not inhale sprays, gases, vapors or mists. Avoid contact with eyes and skin.

Section 8. Exposure Controls/Personal Protection

Hygiene Measures (cont.): Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/Face Protection: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to mists, vapors or sprays. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles, faceshield (8-inch minimum). Refer to 29 CFR 1910.133, ANSI Z87.1, or European Standard EN166.

Skin Protection

Hand Protection: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: Chemical-resistant gloves.

Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. For full contact, use Neoprene or nitrile rubber.

Other Skin Protection: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory Protection: Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Section 9. Physical and Chemical Properties

Physical State:	Liquid.
Color:	Pale yellow.
Odor:	No data available.
pH:	No data available.
Freezing Point:	No data available.
Boiling Point:	No data available.
Flash Point:	No data available.
Flammability:	No data available.
Auto-ignition temperature:	No data available.
Specific Gravity:	No data available.
Vapor Pressure:	No data available.
Vapor Density:	No data available.
Water Solubility:	Reacts slowly with water to produce flammable gases.
Evaporation Rate:	No data available.
Viscosity:	No data available.

Section 10. Stability and Reactivity

Reactivity:	This product reacts slowly with water and compounds containing active hydrogen such as alcohols and acids to produce flammable and potentially toxic gases.
Chemical Stability:	This product is stable when stored under a dry, inert atmosphere and away from heat. Nitrogen containing less than 5 ppm each moisture and air is recommended.
Conditions to Avoid:	Exposure to water/moisture, extremes of temperature and direct sunlight.
Incompatible Materials:	Strong oxidizing agents.
Hazardous Decomposition Products:	Under normal conditions of storage and use, hazardous decomposition products should not be produced. In contact with water, slowly releases flammable and potentially toxic gases. Hazardous decomposition products formed under fire conditions: carbon oxides (CO_X), nitrogen oxides (NO_X), and niobium oxide fumes. In the event of a fire: see section 5.
Possibility of Hazardous Reactions:	Under normal conditions of storage and use noted above, hazardous reactions will not occur. Hazardous reactions or instability may occur under certain conditions of storage or use. In contact with water, product releases flammable and potentially toxic gases.

Section 11. Toxicological Information

Information on Toxicological Effects

Acute Toxicity : No specific data is available for this product.

Component	CAS No	Result	Species	Dose	Exposure
Dimethylaminoethanol	108-01-0	LC50 Inhalation	Rat	6 mg/l	4 h

Irritation/Corrosion : No specific data available.

Sensitization : No specific data available.

Germ Cell Mutagenicity : No specific data available.

Carcinogenicity

IARC : No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

ACGIH : No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by ACGIH.

NTP : No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by NTP.

OSHA : No component of this product present at levels greater than 0.1% is identified as probable, possible or confirmed human carcinogen by OSHA.

Reproductive Toxicity : No specific data available.

Teratogenicity : No specific data available.

Specific Target Organ Toxicity (Single Exposure) : No specific data available.

Specific Target Organ Toxicity (Repeated Exposure) : No specific data available.

Aspiration Hazard : No specific data available.

Information on the Likely Routes of Exposure : Common routes of exposure: inhalation, dermal (failure to use skin protection), eye (failure to use safety eyewear). Less common: ingestion (failure to employ recommended hygiene measures (e.g. smoking or eating after handling product without washing hands or using hand protection).

Additional Information : To the best of our knowledge, the chemical, physical and toxicological properties of this product have not been thoroughly investigated.

Section 12. Ecological Information

Numerical Measures of Toxicity : No specific data available.

Persistence and Degradability

Biodegradability : No specific data available.

Bioaccumulative Potential : No specific data available.

Mobility in Soil : No specific data available.

Other Adverse Effects : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Section 13. Disposal Considerations

Waste Treatment Methods

Product : Dispose of in accordance with local, state, and federal regulations. Refer to 40 CFR 260-299 for complete waste disposal regulations. Consult your local, state, or federal agency before disposing of any chemicals.

Contaminated Packaging : Empty containers retain product residue (liquids, vapors and gases) and can be dangerous. Dispose of as unused product.

Section 14. Transport Information

	DOT	IMDG	IATA
UN Number	Not Regulated	Not Regulated	Not Regulated
UN Proper Shipping Name	-	-	-
Transport Hazard Classes	-	-	-
Packing Group	-	-	-
Environmental Hazards	-	-	-
Additional Information	-	-	-

Special Precautions for User : Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transporting in Bulk According to Annex II of MARPOL 73/78 and the IBC Code : Not applicable - this cargo is not intended to be carried in bulk.

Section 15. Regulatory Information

TSCA (Toxic Substance Control Act):
This product is not listed on the U.S. Toxic Substances Control Act Chemical Inventory (TSCA Inventory). Use of this product is restricted to research and development only. This product must be used under the supervision of a technically qualified individual as defined by the TSCA. This product must not be used for commercial purposes or in formulations for commercial purposes.

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards
Acute Health Hazard (Acute toxicity – ingestion, dermal, inhalation; Skin corrosion or irritation; Serious eye damage or eye irritation; Specific Target Organ Toxicity (STOT), single exposure: respiratory irritation).

Massachusetts Right to Know Components
No components are subject to Massachusetts Right to Know Act.

Pennsylvania Right to Know Components
No components are subject to Pennsylvania Right to Know Act.

New Jersey Right to Know Components
No components are subject to New Jersey Right to Know Act.

California Proposition 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

Section 16. Other Information

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

Section 16. Other Information

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

HMIS Rating

HEALTH	**3**
FLAMMABILITY	**1**
PHYSICAL HAZARD	**1**

History

Date of Issue/Date of Revision : 10/5/2024.

Date of Previous Issue : 11/29/2023.

References : None available.

Abbreviations and Acronyms

ACGIH	:	American Conference of Governmental Industrial Hygienists.
ATE	:	Acute Toxicity Estimate (per Chapter 3.1 of GHS 10 standard).
CAS	:	Chemical Abstracts Service (division of the American Chemical Society).
CLP	:	Classification, Labeling and Packaging (European Union (EU)).
DOT	:	US Department of Transportation.
EC No	:	The EC Inventory (EINECS, ELINCS and the NLP-list is the source of the seven digit EC number, an identifier of substances commercially available with the EU (European Union).
EINECS	:	European Inventory of Existing Commercial Chemical Substances.
ELINCS	:	European List of Notified Chemical Substances.
GHS	:	Globally Harmonized System of Classification and Labeling of Chemicals.
HMIS	:	Hazardous Materials Identification System.
HNOC	:	Hazards Not Otherwise Classified.
IARC	:	International Agency for Research on Cancer.
IATA	:	International Air Transport Association.
IATA-DGR	:	Dangerous Goods Regulations by the "International Air Transport Association" (IATA).
IDLH	:	Immediately Dangerous to Life or Health (US National Institute for Occupation Health and Safety (NIOSH)).
IMDG	:	International Maritime Code for Dangerous Goods.
NFPA	:	National Fire Protection Association.
NIOSH	:	National Institute of Occupational Safety and Health.

Section 16. Other Information

Abbreviations and Acronyms (cont.)

NTP	:	National Toxicology Program.
OECD	:	Organization for Economic Co-Operation and Development.
OEL	:	Occupational Exposure Limit.
OSHA	:	Occupational Safety and Health Administration.
PBT	:	Persistent Bioaccumulative and Toxic.
PEL	:	Permissible Exposure Limits.
REL	:	Recommended Exposure Limits.
SARA	:	Superfund Amendments and Reauthorization Act.
STEL (ST)	:	Short Term Exposure Limit (ACGIH/NIOSH)
STOT	:	Specific Target Organ Toxicity.
TLV	:	Threshold Limit Values (ACGIH).
TWA	:	Time Weighted Average.
VOC	:	Volatile Organic Compound.
vPvB	:	Very Persistent and Very Bioaccumulative.

Disclaimer

The information herein is believed to be accurate and is presented in good faith; however, no warranties or representations are made by Ereztech LLC regarding the accuracy or completeness of the information. Ereztech LLC shall not be liable for any damages resulting from the handling, or from the contact with the above product.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

BRIDGING CHEMICAL GAPS