

INTATRADE
MATERIAL SAFETY DATA SHEET
according to 1907/2006/EC, Article 31

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1. IDENTIFICATION OF SUBSTANCE AND OF THE COMPANY

Product name: **Bis(diethylamido)(tert-butylimido) tert-Butoxy niobium(V)**
Product code: EO06785
Company: INTATRADE Chemicals GmbH
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2. HAZARDS IDENTIFICATION

Appearance/Odor: Colorless liquid, odor not determined.
Classification: FLAMMABLE LIQUIDS – Category 2, H225
SUBSTANCES AND MIXTURES WHICH, IN CONTACT WITH
WATER, EMIT FLAMMABLE GASES – Category 2, H261
SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2A, H319
SPECIFIC ORGAN TOXICITY, SINGLE EXPOSURE; RESPIRATORY
TRACT IRRITATION - Category 3, H335

GHS label elements



Hazard pictograms
Signal word
Hazard Statements:

Danger

H225: Highly flammable liquid and vapor.
H261: In contact with water releases flammable gas.
H319: Causes serious eye irritation.
H335: May cause respiratory irritation.

Precautionary Statements
Prevention:

P210: Keep away from heat/sparks/open flames/hot surfaces. – No smoking.
P223: Keep away from any possible contact with water, because of violent reaction and possible flash fire.
P231 + P232: Handle under inert gas. Protect from moisture.
P233: Keep container tightly closed.
P240: Ground/Bond container and receiving equipment.
P241: Use explosion proof electrical/ventilating/lighting/processing equipment.
P242: Use only non-sparking tools.
P243: Take precautionary measures against static discharge.
P261: Avoid breathing fume/gas/mist/vapors/spray.
P264: Wash skin thoroughly after handling.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
P303 + P361 + P353: IF ON SKIN: Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

	P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present. Continue rinsing. P312: Call a POISON CENTER or doctor/physician if you feel unwell. P334 + P335: Brush off loose particles from skin and immerse in cool water/wrap in wet bandages. P337 + P313: If eye irritation persists: Get medical advice/attention. P370 + P378: IN case of fire: Use CO ₂ , dry chemical or foam for extinction.
Storage:	P402 + P404: Store in a dry place. Store in a closed container. P403 + P233 + P235: Store in a well ventilated place. Keep container tightly closed. Keep cool. P405: Store locked up.
Disposal:	P501: Dispose of contents/ container to an approved wasted disposal plant.
OSHA/HCS Status:	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Hazards not otherwise classified:	Reacts violently with water.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Formula:	C ₁₆ H ₃₈ N ₃ ONb
Molecular weight:	381.41 g/mol
CAS-No.:	1770852-75-9

Bis(diethylamido)(tert-butylimido)tert-butoxy niobium(V) >98

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.

4. FIRST AID MEASURES

Description of Necessary First Aid Measures

General Advice:	Move out of dangerous area. Call a POISON CENTER or doctor/physician if symptoms develop or if you feel unwell. Show this safety data sheet to the doctor in attendance.
Eye Contact:	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue rinsing. Seek medical attention if eye irritation develops and persists.
Skin Contact:	Wash off contaminated skin with soap and plenty of water. Seek medical attention if irritation develops and persists or if burns occur.
Inhalation:	Remove victim to fresh air and keep at rest in a position 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. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Call a POISON CENTER or doctor/physician if symptoms develop or if you feel unwell.
Ingestion:	Rinse mouth. 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. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Call a POISON CENTER or doctor/physician if symptoms develop or if you feel unwell.

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

Eye Contact:	Symptoms may include stinging, tearing, redness, swelling and blurred vision.
Inhalation:	May be irritating to respiratory system. Symptoms may include coughing, sore throat, nausea, headache, vomiting.
Skin Contact:	Symptoms may include an itching or burning sensation, reddening, swelling and blistering with tissue necrosis.
Ingestion:	Product is may be expected to be irritating to mucous membranes. Symptoms may include cramping, localized pain, headache, nausea and vomiting.
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)

5. FIRE FIGHTING MEASURES

General Hazards:	Product reacts violently with water to release extremely flammable gases.
Suitable Extinguishing Media:	THE MOST EFFECTIVE FIRE EXTINGUISHING AGENT IS DRY CHEMICAL POWDER PRESSURIZED WITH NITROGEN. Vermiculite, 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.
Unusual Fire and Explosion Hazards:	This material reacts with water and compounds containing active hydrogen such as alcohols and acids to produce flammable liquids and gases. Product runoff to sewer may create a fire or explosion hazard. Vapors and gases produced 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:	Decomposition products include carbon oxides (CO _x), nitrogen oxides (NO _x) and niobium oxides. Irritating fumes and organic acid 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 breathing 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. 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.

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. Remove all sources of ignition. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.
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For Emergency Responders:	Do not touch or walk through spilled material. Avoid mist and aerosol formation. Avoid inhalation of sprays, mists, vapors and gases. Provide adequate ventilation. Wear respiratory protection. Put on appropriate personal protective equipment. 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 nonemergency 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:	Eliminate all local and distant ignition sources. Move containers from spill area if safe to do so. Avoid allowing the spilled material to get wet or using water to clean up spillages or residues. Use spark-proof tools and explosion-proof equipment.
Small Spill:	Contain and collect spillage with non-combustible, dry absorbent material (e.g. sand, earth, vermiculite or diatomaceous earth) and place in dry, sealed container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor.
Large Spill:	Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, dry absorbent material (e.g. sand, earth, vermiculite or diatomaceous earth) and place in dry, sealed container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

7. HANDLING AND STORAGE

Precautions:	Product is moisture sensitive; handle under a dry, inert gas. Nitrogen with less than 5 ppm each of moisture and oxygen is recommended. Keep away from all sources of ignition – NO SMOKING. 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.
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 and 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 moisture sensitive; store under an inert gas. Nitrogen with less than 5 ppm each of moisture and oxygen is recommended. Store refrigerated at 2 – 8 °C. Keep away from all sources of ignition – NO SMOKING. 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.

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 explosion-proof, 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:	Wash 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, mists, vapors or aerosols. Avoid contact with eyes and skin. 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 sprays, mist, vapors and gases. 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. For full contact, wear Neoprene or nitrile rubber 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.
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).

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid.
Color:	Colorless.
Odor:	No data available.
Odor Threshold:	No data available.
pH:	No data available.
Melting Point:	No data available.
Boiling Point:	55 - 65 °C (131 - 149 °F) @ 100 mTorr.
Flash Point:	No data available.
Specific Gravity:	No data available.
Vapor Pressure:	No data available.
Vapor Density:	No data available.
Water Solubility:	Reacts with water to produce flammable gases.

10. STABILITY AND REACTIVITY

Reactivity:	This product reacts violently with water and compounds containing active hydrogen such as alcohols and acids to release highly flammable 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 and a temperature range of 2 – 8 °C is recommended. This product is not sensitive to impact.
Conditions to Avoid:	Exposure to water/moisture, sources of ignition (heat, flames, sparks, electrostatic discharge), extremes of temperature and direct sunlight.
Incompatible Materials:	Water, compounds containing active hydrogen (alcohols, acids) and strong oxidizing agents.
Hazardous Decomposition Products:	Decomposition products include carbon oxides (COx), nitrogen oxides (NOx) and niobium oxides. Irritating fumes and organic acid vapors may be generated during exposure to elevated temperatures or open flame. 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 extremely flammable gases.

11. TOXICOLOGICAL INFORMATION

Information on Toxicological Effects

Acute Toxicity:	No specific data available.
Irritation/Corrosion:	Causes serious eye irritation.
Sensitization:	No specific data available.
Germ Cell Mutagenicity:	No effects known.
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:	This product is not expected to cause reproductive or developmental effects.
Teratogenicity:	No specific data available.
Specific Target Organ Toxicity: (Single Exposure)	Inhalation – May cause respiratory tract irritation.
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:	Product may be harmful if inhaled or ingested. To the best of our knowledge, the chemical, physical and toxicological properties of this product have not been thoroughly investigated.

12. ECOLOGICAL INFORMATION

Numerical Measures of Toxicity	
Toxicity to Fish:	No specific data available.
Toxicity to Daphnia and other aquatic invertebrates:	No specific data available.
Toxicity to Algae:	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.

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 (liquid and/or vapor) and can be dangerous. Dispose of as unused product. DO NOT EXPOSE OPENED/EMPTY CONTAINERS TO MOISTURE/WATER, HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

14. TRANSPORT INFORMATION

	DOT	IMDG	IATA
UN Number	UN 3399	UN 3399	UN 3399
UN Proper Shipping Name	Organometallic substance, liquid, water-reactive, flammable (Bis(diethylamido)(tert-butylimido) tert-Butoxy niobium(V))		
Transport Hazard Classes	4.3(3)	4.3(3)	4.3(3)
Packing Group	II	II	II

Environmental Hazards	No	No	No
Additional Information	-	EMS-No: F-G, S-N	-
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.		

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	Fire Hazard (Flammable liquid), Reactivity Hazard (In contact with water emits flammable gas), Acute Health Hazard (Serious eye damage or eye irritation; Specific Target Organ Toxicity (STOT), single exposure: respiratory irritation).

16. OTHER INFORMATION

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Intatrade Chemicals GmbH shall not be held liable for any damage resulting from handling or from contact with the above product.