



**MATERIAL SAFETY DATA SHEET**  
COMPLIES WITH 29 CFR 1910.1200.  
OSHA HAZARD COMMUNICATION RULE

**DATE OF LAST REVISION: 7-22-05**

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## 1. CHEMICAL IDENTITY

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LABEL IDENTITY	<b>NIOBIUM OXIDE</b>
CHEMICAL NAME/SYNONYMS	<b>NIOBIUM OXIDE</b>
FORMULA	<b>Nb<sub>2</sub>O<sub>5</sub></b>
CALCULATED MOLECULAR WEIGHT	<b>92.91</b>
CHEMICAL FAMILY	<b>GROUP 5 METAL</b>
CAS REGISTRY NUMBER	<b>7440-03-1</b>
HAZARDOUS INGREDIENTS	<b>NIOBIUM</b>
%: <b>99</b>	TLV: <b>NA</b> OSHA/PEL: <b>15mg/m3</b>

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## 2. PHYSICAL AND CHEMICAL PROPERTIES

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COLOR, FORM AND ODOR	<b>White Powder/Target, Odorless</b>
BOILING POINT	<b>N/A</b>
DENSITY (gm/cc)	<b>N/A</b>
VAPOR PRESSURE @ 20°	<b>NA</b>
% VOLATILE BY VOLUME (%)	<b>N/A</b>
REACTION WITH WATER	<b>NA</b>
EVAPORATION RATE (H <sub>2</sub> O=1)	<b>NA</b>
SOLUBILITY IN WATER	<b>Soluble</b>
MELTING POINT	<b>N/A</b>

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## 3. FIRE AND EXPLOSION HAZARD DATA

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FLASH POINT	<b>N/A</b>
AUTOIGNITION TEMPERATURE (°C)	<b>N/A</b>
FLAMMABILITY	<b>Will not ignite</b>
EXTINGUISHING MEDIA	<b>Dry table salt or type D fire extinguisher</b>
SPECIAL FIRE FIGHTING PROCEDURES	<b>Isolate burning material. It is advisable to allow fires to burnout, keeping the fire from spreading. Wear reflective heat resistant suit. Small fires can be controlled by smothering with dry table salt or using Type O powder fire extinguishing material.</b>
UNUSUAL FIRE & EXPLOSION HAZARDS	<b>Do not spray water on burning fires, chips or powder as a violent explosion may result. The hazard increases with finer particles, Carbon dioxide is not effective in extinguishing burning niobium.</b>



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### 4. HEALTH HAZARD INFORMATION

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**TOXICITY DATA: No toxicity has been shown for metallic Niobium. Laboratory test with soluble niobium compounds show low oral toxicity. Potassium niobate had an oral rat LD50 of 725mg/Nb/kg while potassium niobate introduced into abdominal cavity had a rat LD50 of 92mg/kg and a mouse LD50 of 13mg/kg.**

**HMIS RATING:**

**HEALTH: 0 FLAMMABILITY: 0 REACTIVITY: 0 PERSONAL PROTECTION: 0**

**ROUTES OF ENTRY**

**INHALATION: No  
SKIN: No  
INGESTION: No**

**MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: No data**

**EFFECTS OF OVEREXPOSURE (acute and chronic):**

**INHALATION: None SKIN: None  
INGESTION: None EYE: None**

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**CARCINOGENICITY: No NTP: No IARC MONOGRAPHS: No OSHA REGULATE: No**

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**EMERGENCY FIRST AID PROCEDURES:**

**INHALATION: NA INGESTION: NA SKIN: NA  
EYE: Normal procedure for foreign objects**

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### 5. REACTIVITY DATA

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**STABILITY  
CONDITIONS CONTRIBUTING TO UNSTABILITY**

**Stable  
Nb metal is rapidly dissolved by hydrofluoric acid hydrofuoric nitric acid mixture. Nb ignites in cold fluorine and above 200°C will react exothermically with chlorine, bromine, and halocarbons such as carbon tetrachloride, carbon tetrafluoride, and freons.**

**INCOMPATIBILITY (MATERIALS TO AVOID)**

**The above reactions with incompatible materials will generate hazardous reaction products such as flammable hydrogen, toxic fumes of nitrogen oxides or corrosive niobium halide vapors.**



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### 5. REACTIVITY DATA CONTINUED

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HAZARDOUS DECOMPOSITION PRODUCTS	<b>ND</b>
HAZARDOUS POLYMERIZATION	<b>Will Not Occur</b>
CONDITIONS TO AVOID	<b>ND</b>

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### 6. SAFE HANDLING AND USE

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STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:  
**No special procedure**

WASTE DISPOSAL METHOD:  
**Fine non-recyclable scrap should be burned in small quantities under controlled conditions. The resulting is inert and can be deposited in a landfill.**

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### 7. SPECIAL PROTECTIVE INFORMATION

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RESPIRATORY PROTECTION	<b>Use normal precautions if particulate material is present</b>
LOCAL EXHAUST	<b>ND</b>
MECHANICAL (general)	<b>ND</b>
PROTECTIVE GLOVES	<b>Recommended to avoid cuts</b>
EYE PROTECTION	<b>Safety glasses</b>
OTHER PROTECTIVE EQUIPMENT	<b>Solid metal will not ignite. High surface area material such as 5 micron powder may ignite at room temperature.</b>

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### 8. SPECIAL PRECAUTIONS

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PRECAUTIONS TO BE TAKEN IN HANDLING/STORAGE:  
**Machining of Niobium may result in fine turnings, chips or dust. Any material with a dimension less than 0.001" is flammable. Keep away from any source of ignition.**

TRANSPORTATION REQUIREMENTS	DOT CLASS:	<b>NA</b>
	UN NUMBER:	<b>NA</b>
	IMCO CLASS:	<b>NA</b>
	OTHER:	<b>NA</b>



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### 8. SPECIAL PRECAUTIONS CONTINUED

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PRECAUTIONARY LABELING

**NONE**

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THE ABOVE INFORMATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE. HOWEVER, SINCE DATA, SAFETY STANDARDS AND GOVERNMENT REGULATIONS ARE SUBJECT TO CHANGE THE CONDITIONS OF HANDLING AND USE, OR MISUSE ARE BEYOND OUR CONTROL, **ANGSTROM SCIENCES** MAKE NO WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR THE RELIANCE THEREON. USER SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.

NA= NOT APPLICABLE

ND= NO DATA FOUND