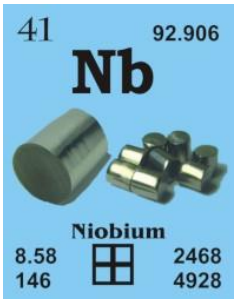
Niobium $_{41}Nb^{92.906}$



Atomic number	41
Density in g/cm³	8.58
Atomic radius in pm	198
Atomic weight	92.906
Melting point in °C	2468
Boiling point in °C	4928

Discovered in 1801 by C. Hatchett at London, England.

[Greek, Niobe = daughter of Tantalus]
French: Niobium
German: Niob
Italian: Niobio
Spanish: Niobio

Description: Niobium is a shiny, silvery metal, which is soft when pure. It resists corrosion due to an oxide film on the surface. Niobium is attacked by hot, concentrated acids, but resists attack by alkalis, even when they are molten. Niobium is used in stainless steels.

NIOBIUM SINGLE CRYSTAL PROPERTIES

State:	single crystal
Crystal structure:	bcc
Production method:	Floating Zone
Standard size:	diameter 8-12mm thickness 1-2mm
Orientation:	(100), (110) and (111)
Orientation accuracy:	<2°, <1°, <0.4° or <0.1°
Polishing:	as cut, one or two sides polished
Roughness of surface:	<0.03µm
Purity:	99.99%
Typical analysis (ppm):	C 3 H < 1 O 9 N < 5 Cu 1.60 Fe 1.80 Ni < 1 Pb 0.30 Si 0.30 Ga, Hf and Ta are below the detection limit
Density:	8.4 g/cm3
Melting point:	2467.85 °C / 2741 °K
Boiling point:	4741.85 °C / 5015 °K
Molar volume:	10.84 cm3
Thermal conductivity:	53.7 [300 K] Wm-1K-1
Coefficient of linear thermal expansion:	7.07 x 10-6 K-1

Electrical resistivity:	12.5x 10-8 [273 K] Wm
Mass magnetic susceptibility:	+2.76 x 10-8(s) kg-1m3
Young's modulus:	104.9 GPa
Rigidity modulus:	37.5 GPa
Bulk modulus:	170.3 GPa
Poisson's ratio:	0.397
Radii:	Nb5+ 69; Nb4+ 74; atomic 143; covalent 134
Electronegativity:	1.6 (Pauling); 1.23 (Allred); 4.0 eV (absolute)
Effective nuclear charge:	3.30 (Slater); 6.70 (Clementi); 9.60 (Froese-Fischer)
Number of Isotopes (incl. nuclear isomers):	31
Issotope mass range:	86 -> 103
Crystal structure, (cell dimentions / pm), space group	bcc
X-ray diffraction: mass absorption coefficients:	CuKα 153 (μ/r) / cm2g-1 MoKα 17.1 (μ/r) / cm2g-1
Neutron scattering length:	0.7054 b/10-12 cm
Thermal neutron capture cross-section:	1.15 sa / barns