

	Metric	English
<b>Physical Properties</b>		
Density	19.3 g/cc	0.697 lb/in <sup>3</sup>
a Lattice Constant	3.165 Å	3.165 Å
Melting Point	3370 °C	6100 °F
Boiling Point	5900 °C	10700 °F
<b>Chemical Properties</b>		
Atomic Mass	183.85	183.85
Atomic Number	74	74
Atomic Volume	1.59E-29	1.59E-29
Thermal Neutron Cross Section	19.2 barns/atom	19.2 barns/atom
X-ray Absorption Edge	0.17837 Å	0.17837 Å
	1.02497 Å	1.02497 Å
	1.07436 Å	1.07436 Å
	1.21529 Å	1.21529 Å
Electrode Potential	4.5 V	4.5 V
Electronegativity	1.7	1.7
Ionic Radius	0.620 Å	0.620 Å
	0.700 Å	0.700 Å
Electrochemical Equivalent	3.43 g/A/h	3.43 g/A/h
<b>Mechanical Properties</b>		
Hardness, Brinell	294	294
Hardness, Knoop	318	318
Hardness, Rockwell A	66	66
Hardness, Rockwell C	31	31
Hardness, Vickers	310	310
Tensile Strength, Ultimate	980 MPa	142000 psi
Tensile Strength, Yield	750 MPa	109000 psi
	@Strain 0.200 %	@Strain 0.200 %
Modulus of Elasticity	400 GPa	58000 ksi
	300 GPa	43500 ksi
	@Temperature 1800 °C	@Temperature 3270 °F
	350 GPa	50800 ksi
	@Temperature 1200 °C	@Temperature 2190 °F
	370 GPa	53700 ksi
	@Temperature 800 °C	@Temperature 1470 °F
Poissons Ratio	0.28	0.28
Shear Modulus	156 GPa	22600 ksi
Shear Strength	400 MPa	58000 psi

Electrical Properties		
Electrical Resistivity	0.00000565 ohm-cm	0.00000565 ohm-cm
Magnetic Susceptibility	3.30E-07	3.30E-07
Critical Magnetic Field Strength, Oersted	1.12 – 1.18	1.12 – 1.18
Critical Superconducting Temperature	0.0149 – 0.0159 K	0.0149 – 0.0159 K
Thermal Properties		
Heat of Fusion	184.2 J/g	79.24 BTU/lb
CTE, linear	4.40 $\mu\text{m}/\text{m}\cdot\text{°C}$	2.44 $\mu\text{in}/\text{in}\cdot\text{°F}$
	@Temperature 20.0 – 100 °C	@Temperature 68.0 – 212 °F
Specific Heat Capacity	0.134 J/g-°C	0.0320 BTU/lb-°F
Thermal Conductivity	163.3 W/m-K	1133 BTU-in/hr-ft <sup>2</sup> -°F
	117 W/m-K	812 BTU-in/hr-ft <sup>2</sup> -°F
	@Temperature 1000 °C	@Temperature 1830 °F
	128 W/m-K	888 BTU-in/hr-ft <sup>2</sup> -°F
	@Temperature 600 °C	@Temperature 1110 °F
	146 W/m-K	1010 BTU-in/hr-ft <sup>2</sup> -°F
	@Temperature 200 °C	@Temperature 392 °F
Melting Point	3370 °C	6100 °F
Boiling Point	5900 °C	10700 °F

## References

**CRC Handbook of Chemistry and Physics**, Robert C. Weast, Ed. 62 Edition, CRC Press, Boca Raton, FL, 1981.

**Metallic Materials Specification Handbook**, Fourth Ed., Robert B. Ross, Chapman & Hall, London, 1992

**Metals Handbook**, Vol.2 – Properties and Selection: Nonferrous Alloys and Special-Purpose Materials, ASM International 10th Ed. 1990.

**The Metals Databook**, Alok Nayer, McGraw-Hill, New York, 1997.

**CRC Handbook of Chemistry and Physics**, David R. Lide, Ed. 80th Edition, CRC Press, Boca Raton, FL, 1999.