

Palladium ${}_{46}\text{Pd}^{106.4}$

Discovered in 1803 by W.H. Wollaston at London, England.

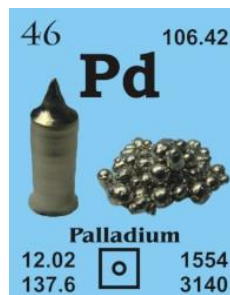
[Named after the asteroid Pallas]

French: palladium

German: Palladium

Italian: palladio

Spanish: palladio



Atomic number	46
Density in g/cm ³	12.02
Atomic radius in pm	137.6
Atomic weight	106.42
Melting point in °C	1554
Boiling point in °C	3140

Description: Palladium is a lustrous, silvery-white, malleable and ductile metal of the so-called platinum group. It resists corrosion, but dissolves in oxidising acids and in molten alkalis. Palladium metal has the unusual ability of allowing hydrogen gas to filter through it. It is mainly used as a catalyst.

PALLADIUM SINGLE CRYSTAL PROPERTIES

State:	single crystal
Crystal structure:	fcc
Production method:	Czochralski
Standard size:	diameter 6-12mm 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:	99.999%
	C 3
	H < 1
	O 9
	N < 5
Typical analysis (ppm):	Cu 1.60
	Fe 1.80
	Ni < 1
	Pb 0.30
	Si 0.30
	Ga, Hf and Ta are below the detection limit
Density:	12.0 g/cm ³
Melting point:	1551.85 °C / 1825 °K
Boiling point:	3139.85 °C / 3413 °K
Molar volume:	8.85 cm ³
Thermal conductivity:	71.8 [300 K] Wm ⁻¹ K ⁻¹

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Coefficient of linear thermal expansion:	11.2 x 10 ⁻⁶ K ⁻¹
Electrical resistivity:	10.8x 10 ⁻⁸ [293 K] Wm
Mass magnetic susceptibility:	+6.702 x 10 ⁻⁸ (s) kg ⁻¹ m ³
Young's modulus:	121 GPa
Rigidity modulus:	43.6 GPa
Bulk modulus:	187 GPa
Poisson's ratio:	0.39
Radii:	Pd4+ 64; Pd2+ 86; atomic 138; covalent 128
Electronegativity:	2.20 (Pauling); 1.35 (Allred); 4.45 eV (absolute)
Effective nuclear charge:	4.05 (Slater); 7.84 (Clementi); 11.11 (Froese-Fischer)
Number of Isotopes (incl. nuclear isomers):	25
Isotope mass range:	96 -> 116
Crystal structure, (cell dimensions / pm), space group	fcc
X-ray diffraction: mass absorption coefficients:	CuK α 206 (μ/r) / cm ² g ⁻¹ MoK α 24.1 (μ/r) / cm ² g ⁻¹
Neutron scattering length:	0.591 b/10 ⁻¹² cm
Thermal neutron capture cross-section:	6.9 sa / barns

