

Rhodium ${}_{45}\text{Rh}^{102.905}$

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

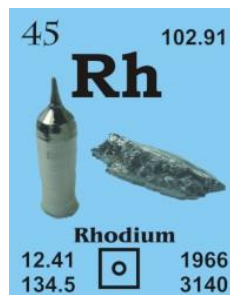
[Greek, rhodon = rose]

French: rhodium

German: Rhodium

Italian: rodio

Spanish: rodio



Atomic number	45
Density in g/cm ³	12.41
Atomic radius in pm	173
Atomic weight	102.91
Melting point in °C	1966
Boiling point in °C	3695

Description: Rhodium is a rare, lustrous, silvery, hard metal of the so-called platinum group. It is unaffected by air and water up to 875 K, and unaffected by acids, but is attacked by molten alkalis. Rhodium is used as a catalyst.

RHODIUM SINGLE CRYSTAL PROPERTIES

State:	single crystal
Crystal structure:	fcc
Production method:	Floating Zone
Standard size:	diameter 6–10mm 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%
	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:	12.4 g/cm ³
Melting point:	1965.85 °C / 2239 °K
Boiling point:	3726.85 °C / 4000 °K
Molar volume:	8.29 cm ³
Thermal conductivity:	150 [300 K] Wm ⁻¹ K ⁻¹
Coefficient of linear thermal expansion:	8.40 x 10 ⁻⁶ K ⁻¹
Typical analysis (ppm):	

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Electrical resistivity:	4.51x 10 ⁻⁸ [293 K] Wm
Mass magnetic susceptibility:	+1.36 x 10 ⁻⁸ (s) kg ⁻¹ m ³
Young's modulus:	379 GPa
Rigidity modulus:	147 GPa
Bulk modulus:	276 GPa
Poisson's ratio:	0.26
Radii:	Rh4+ 67; Rh3+ 75; Rh2+ 86; atomic 134; covalent 12
Electronegativity:	2.28 (Pauling); 1.45 (Allred); 4.30 eV (absolute)
Effective nuclear charge:	3.90 (Slater); 7.64 (Clementi); 10.85 (Froese-Fischer)
Number of Isotopes (incl. nuclear isomers):	34
Isotope mass range:	94m -> 112
Crystal structure, (cell dimensions / pm), space group	fcc
X-ray diffraction: mass absorption coefficients:	CuK α 194 (μ/r) / cm ² g ⁻¹ MoK α 22.6 (μ/r) / cm ² g ⁻¹
Neutron scattering length:	0.588 b/10 ⁻¹² cm
Thermal neutron capture cross-section:	144.8 sa / barns

