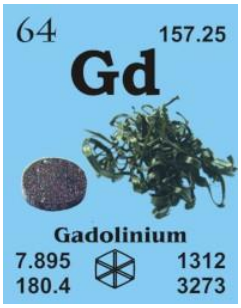
Gadolinium $_{64}Gd^{157.25}$

Gadolinium was discovered in 1880 by J.C. Galissard de Marignac at Geneva, Switzerland. Isolated in 1886 by P.E. Lecoq de Boisbaudren at Paris, France.

[Named after J. Gadolin, a Finnish minerologist]
French: gadolinium
German: Gadolinium
Italian: gadolinio
Spanish: gadolinio



Atomic number	64
Density in g/cm³	7.895
Atomic radius in pm	233
Atomic weight	157.25
Melting point in °C	1312
Boiling point in °C	3273

Description: Gadolinium is a soft, silvery metal of the so-called rare earth group (more correctly termed the lanthanides). It reacts slowly with oxygen and water, and dissolves in acids. Gadolinium is used in magnets, electronics, refractories, neutron radiography, and alloyed with iron, for magneto-optic recording devices.

GADOLINIUM SINGLE CRYSTAL PROPERTIES

State:	Single crystal
Crystal structure:	Hexagonal
Production method:	Czochralski
Standard size:	diameter 6-10mm thickness 1-2mm
Orientation:	(0001)
Orientation accuracy:	<2°, <1°, <0.4° or <0.1°
Polishing:	as cut, one or two sides polished
Roughness of surface:	<0.03 µm
Purity:	99.99%
Crystal structure:	(cell dimensions/pm), space group, a-Gd h.c.p. (a=363.60, c=578.26), P63/mmc b-Gd b.c.c. (a=405), Im3m T(a->b)=1535 K High pressure form: (a=361, c=2603), R3m
X-ray diffractions mass absorption coefficients:	CuK□ 439 (µ/□) / cm2g-1 MoK□ 64.4 (µ/□) / cm2g-1
Neutron scattering length:	0.65 b/10-12 cm
Thermal neutron capture cross-section:	49000 □a / barns
Density:	7.89 kg/m-3 [293 K]; 2390 [liquid at m.p.]
Melting point:	1312.85 °C / 1586 °K
Boiling point:	3265.85 °C / 3539 °K
Molar volume:	10.00 cm3
Thermal conductivity:	10.6 [300 K] Wm-1K-1

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Coefficient of linear thermal expansion:	8.6 x 10-6 K-1
Electrical resistivity:	134.0 x 10-8 [293 K] ⊠m
Mass magnetic susceptibility:	+6.030 x 10-5(s) kg-1m3
Young's modulus:	54.8 GPa
Rigidity modulus:	21.8 GPa
Bulk modulus:	37.9 GPa
Poisson's ratio:	0.259
Radi:	Gd3+ 97; atomic 180; covalent 161
Electronegativity:	1.20 (Pauling); 1.11 (Allred); £3.3 eV (absolute)
Effective nuclear charge:	2.85 (Slater); 8.22 (Clementi); 11.28 (Froese-Fischer)
Number of Isotopes (incl. nuclear isomers):	23
Isotope mass range:	143 -> 163