


Gadolinium - Gd

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Atomic number	64	
Atomic mass	157.25 g.mol ⁻¹	
Electronegativity according to Pauling	1.1	
Density	7.9 g.cm ⁻³ at 20°C	
Melting point	1313 °C	
Boiling point	3266 °C	
Vanderwaals radius	unknown	
Ionic radius	unknown	
Isotopes	13	
Electronic shell	[Xe] 4f ⁷ 5d ¹ 6s ²	
Energy of first ionisation	591.4 kJ.mol ⁻¹	
Energy of second ionisation	1165.5 kJ.mol ⁻¹	
Standard potential	- 2.40 V	
Discovered by	Jean de Marignac in 1880	

Gadolinium

Gadolinium is a soft, shiny, ductile, silvery metal belonging to the lanthanide group of the periodic chart. The metal does not tarnish in dry air but an oxide film forms in moist air. Gadolinium reacts slowly with water and dissolves in acids. Gadolinium becomes superconductive below 1083 K. It is strongly magnetic at room temperature.

Applications

Gadolinium has found some use in control rods for nuclear reactors and nuclear power plants; it is used to make garnets for microwave applications and its compounds are used for making phosphorous for colour TV tubes. Metallic gadolinium is rarely used as the metal itself, but its alloys are used to make magnets and electronic components such as recording heads for video recorders. It is also used for manufacturing compact disks and computer memory.

Gadolinium in the environment

Gadolinium is one of the more abundant rare-earth elements. It is never found as free element in nature, but it is contained in many rare minerals. The main mining areas are Cina, USA, Brazil, Sri Lanka, India and Australia with reserves expected to exceed one million tonnes. World production of pure gadolinium is about 400 tonnes per year.

Health effects of gadolinium

Gadolinium, as the other lanthanides, forms compounds of low to moderate toxicity. Gadolinium salts irritate skin and eyes and are suspected to be tumorigens. Gadolinium toxicity has not been investigated in detail.

Environmental effects of gadolinium

Gadolinium poses no environmental threat to plants and animals.