Magnesium - Mg

Chemical properties of magnesium - Health effects of magnesium - Environmental effects of magnesium

Atomic number	12
Atomic mass	24.305 g.mol $^{-1}$
Electronegativity according to Pauling	1.2
Density	1.74 g.cm $^{-3}$ at 20 °C
Melting point	650 °C
Boiling point	1107 °C
Vanderwaals radius	0.16 nm
Ionic radius	0.065 nm
Isotopes	5
Electronic shell	[Ne] $3s^2$
Energy of first ionisation	737.5 kJ.mol $^{-1}$
Energy of second ionisation	1450 kJ.mol $^{-1}$
Standard potential	- 2.34 V
Discovered by	Sir Humphrey Davy in 1808

Magnesium

Chemical element, metallic, symbol Mg, situated in group IIa in the periodic table, atomic number: 12, atomic weight: 24,312. Magnesium is silvery white and very light. Its relative density is 1,74 and it's density 1740 kg/m^3 (0.063 lb/in^3 or 108.6 lb/ft^3). Magnesium is known for a long time as the lighter structural metal in the industry, due to it's low weight and to it's capability of forming mechanically resistant alloys.

Magnesium is very chemically active, it takes the place of hydrogen in boiling water and a great number of metals can be produced by thermic reduction of its salts and oxidized forms with magnesium. It joins together with most non-metals and almost every acid. Magnesium reacts only slightly or not at all with most of the alkalis and many organic substances, like hydrocarbons, aldehides, alcohols, phenols, amines, esters and most of the oils. Used as a catalyst, magnesium promotes organic reactions of condensation, reduction, addition and dehalogenization. It was used for a long time for synthesizing special and complex organic components by the well-known Grignard reaction. The main ingredients of the alloys are: aluminum, manganese, zircon, zinc, rare-earth metals and thorium.

Applications

Magnesium compounds are used as refractory material in furnace linings for producing metals (iron and steel, nonferrous metals), glass, and cement.
With a density of only two thirds of the aluminum's, it has countless applications in cases where weight reducing is important, i.e. in aeroplane and missile construction. It also has many useful chemical and metallurgic properties, which make it appropriate for many other non-structural applications.
Magnesium components are widely used in industry and agriculture.
Other uses include: removal of sulphur form iron and steel, photoengraved plates in the printing industry; reducing agent for the production of pure uranium and other metals from their salts; flashlight photography, flares, and pyrotechnics.

Magnesium in the environment

Magnesium is the eighth most abundant element and constitutes about 2% af the Earth's crust by weight, and it is the third most plentiful element dissolved in seawater.
It's very abundant in nature, and it's found in important quantities in many rocky minerals, like dolomite, magnetite, olivine and serpentine. It's also found in seawater, underground brines and salty layers. It's the third most abundant structural metal in the earth's crust, only exceeded by aluminum and iron.
The United States has traditionally been the major world supplier of this metal, supplying 45% of world production even as recently as 1995. Dolomite and magnesite are mined to the extent of 10 million tonnes per year, in countries such as China, Turkey, North Korea, Slovakia, Austria, Russia and Greece.

Health effects of magnesium

Humans take in between 250 and 350 mg/day of magnesium and need at least 200 mg, but the body deals very effectively with this element, taking it form food when it can, and recycling what we already have when it cannot.

There is no evidence that magnesium produces systemic poisoning although persistent over-indulgence in taking magnesium supplements and medicines can lead to muscule weakness, lethargy and confusion.

Effects of exposure to magnesium powder: low toxicity & not considered to be hazardous to health. Inhalation: dust may irritate mucous membranes or upper respiratory tract. Eyes: mechanical injury or particle may embed in eye. Viewing of burning magnesium powder without fire glasses may result in "Welder's flash", due to intense white flame. Skin: embedding of particle in skin. Ingestion: unlikely; however, ingestion of large amounts of magnesium powder could cause injury.

Magnesium has not been tested, but it's not suspected of being carcinogenic, mutagenic or teratogenic. Exposure to magnesium oxide fume subsequent to burning, welding or molten