COMETAL

Your Door to Raw Materials & Markets

Magnesium

Description

Magnesium has an atomic number Z = 12. It is the seventh most abundant element and accounts for 2% approx. of the Earth's crust and it is the third most abundant element dissolved in seawater. Magnesium ions are essential for all living cells. The pure metal is not found naturally. Once produced from magnesium salts, this alkaline earth metal is used as an alloying element. Its name comes from Magnesia, which is a designated Greek region of Thessaly.
Magnesium is present in the composition of over 60 minerals; the most industrially important deposits are dolomie, dolomite, magnesite, brucite, carnallite and olivine. Through the addition of calcium hydroxide to seawater a magnesium hydroxide precipitate can be obtained, which can then be concentrated in the form of magnesium chloride by treatment with hydrochloric acid. Finally it is possible to obtain the metallic magnesium from magnesium chloride through an electrolytic process.

Properties

Physical Properties		Electronic Properties	
Name	Magnesium	Valence	2
Atomic Number Z	12	Electro negativity	1.2
Symbol	Mg	Covalent Radius	1.3
Atomic Weight	24.305	Ionic Radius	0.65
Density (g/ml)	1.74	Atomic Radius	1.6
Boiling Point° C	1107	Atomic Structure	$[Ne]3s^2$
Melting Point° C	650	Ionization Potential (eV)	7.65

Magnesium is chemically very active, and displaces hydrogen in boiling water and a large number of metals can be prepared by thermal reduction of its salts and oxides with magnesium. It combines with most non-metals and virtually all acids. Magnesium does not or only slightly react with most of the alkalis and many organic substances such as hydrocarbons, aldehydes, alcohols, phenols, amines, esters and most oils.
When used as a catalyst, magnesium works to promote condensation, reduction, addition and dehalogenation organic reactions. For a long time, magnesium has been used in the synthesis of special and complex organic compounds through the well-known Grignard reaction. Magnesium also reacts with hydrochloric acid (HCl) producing heat and hydrogen that is released to the atmosphere as bubbles. At high temperatures, the reaction occurs even faster.
As its density is only about two thirds of that of Aluminium, it has countless applications in cases where reduced weight is very important, such as in the automotive sector.

Magnesium is a highly flammable metal which easily burns when in the form of shavings or powder, while it is less flammable in solid mass shapes (Ingots, etc.). Once ignited it is difficult to extinguish, since it reacts both with nitrogen (forming magnesium nitrate) and carbon dioxide (forming magnesium oxide and carbon), which are present in the air. When burned in air, magnesium produces a very intense white glowing flame.
The bulk of metallic magnesium (ingots, etc.) is not classified as a hazardous substance by EU Regulations nor as a hazardous good for transportation. However, in the form of powder or chips, turnings, pellets, etc, it is classified as hazardous:

Magnesium powder (Pyrophoric)(EC:231-104-6):
- Water-react. 1, H260
- Pyr. Sol. 1, H250

Magnesium turnings, pellets, etc.:
- Flam. Sol. 1, H228
- Water-react. 2, H261
- Self-heat. 1, H252

Magnesium in turnings, pellets, etc, is considered as a hazardous good for transit, A is No. 1869, Class 4.1

Uses

- Ductile iron.
- Reducing agent.
- Luminaries.

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