Stable isotopes of magnesium available from ISOFLEX

Isotope	Z(p)	N(n)	Atomic Mass	Natural Abundance	Enrichment Level	Chemical Form
Mg-24	12	12	23.9850419	78.99%	99.75%	Oxide
Mg-25	12	13	24.9858370	10.00%	≥98.30%	Oxide
Mg-26	12	14	25.9825930	11.01%	99.60%	Oxide

12
Mg

Magnesium was discovered in 1755 by Sir Humphrey Davy. It is a silvery-white metal, and its name originates from the Greek name *Magnesia*, a district of Thessaly. It occurs in all plants — its porphyrin complex, chlorophyll, is essential for photosynthesis. It is also an essential nutrient for humans.

Magnesium is a silvery-white metal with a close-packed hexagonal structure. It is soluble in dilute acids and reacts very slowly with water at ordinary temperatures. At room temperature, it is not attacked by air; however, when heated, it burns with a dazzling white light, forming the oxide MgO and the nitride Mg_3N_2. At ordinary temperatures, magnesium is stable in alkalis, both dilute and concentrated; however, hot solutions of alkalis above 60 ºC attack the metal. Magnesium combines with halogens at elevated temperatures, forming halides; and with nitrogen phosphorus, sulfur, and selenium at elevated temperatures, forming their binary compounds. Magnesium exhibits single displacement reactions, replacing lower metals in electrochemical series from their salt solutions or melt. Magnesium also reduces nonmetallic oxides such as carbon dioxide, carbon monoxide, sulfur dioxide and nitrous oxide, burning at elevated temperatures.

According to anecdotal history, in 1618, a farmer in Epsom, England, attempted to feed his cows water from a well. Because of the bitter taste, the cows refused to drink the water. However, the farmer noticed that the same water seemed to heal scratches and rashes. The fame of “Epsom salts” spread. Eventually the compound *magnesium sulfate* was recognized.

Today, magnesium has many practical applications, including the production of titanium by Kroll process and obtaining uranium from its fluoride. Magnesium alloys with aluminum, zinc, copper, nickel, lead, zirconium and other metals are used in automobile parts, aircraft, missiles, space vehicles, ship hulls, underground pipelines, memory discs, machine tools, furniture, lawnmowers, ladders, toys and sporting goods. It is also used in making small and lightweight dry cell batteries. Chemical applications of magnesium include its uses as a reducing agent, in preparation of Grignard reagents for organic syntheses, and for purifying gases. Magnesium is also used in blasting compositions, explosive sensitizers, incendiaries, signal flares and pyrotechnics.

Properties of Magnesium

Name	Magnesium
Symbol	Mg
Atomic number	12
Atomic weight	24.305
Standard state	Solid at 298 °K
CAS Registry ID	7439-95-4

ISOFLEX
Isotopes for Science, Medicine and Industry

1-415-440-4433 | USA & Canada Toll Free 1-888-399-4433 | Fax 1-415-563-4433
PO Box 29475 | San Francisco, CA 94129 USA | isoflex.com

Properties of Magnesium (continued)

Group in periodic table	2
Group name	Alkaline earth metal
Period in periodic table	3
Block in periodic table	s-block
Color	Silvery white
Classification	Metallic
Melting point	650 °C
Boiling point	1090 °C
Vaporization point	1090 ºC
Thermal conductivity	1.56 W/(m·K) at 298.2 °K
Electrical resistivity	4.46 µΩ·cm at 20 °C
Electronegativity	1.20
Specific heat	1.05 kJ/kg K
Heat of vaporization	128 kJ·mol^{-1} at 1090 °C
Heat of fusion	8.7 kJ·mol^{-1}
Density of liquid	1.57 g/cm^3 at 650 ºC
Density of solid	1.74 g/cm^3 at 20 °C
Atomic radius	1.60 Å
Ionic radius	Mg^{2+}: 0.72 Å
Oxidation state	+2
Electron configuration	[Ne]3s^2

ISOFLEX
Isotopes for Science, Medicine and Industry

1-415-440-4433 | USA & Canada Toll Free 1-888-399-4433 | Fax 1-415-563-4433
PO Box 29475 | San Francisco, CA 94129 USA | isoflex.com