

# II - A GROUP ELEMENTS

## ALKALINE EARTH METALS

Be: Berillium

Ca: Calcium

Sr: Strontim

Mg: Magnesium

Ba: Barium

Ra: Radium

## General Properties of 2A

- \*They give up electrons easily.

- \*They have +2 charge

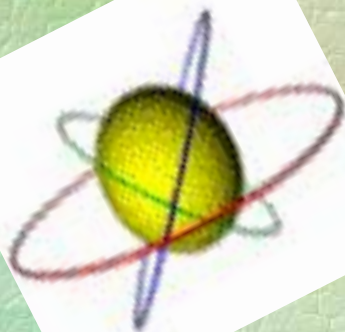
- \*They are not found free in nature.

- \*They are malleable.

- \*They conduct electricity well.

- \*

Radium is radioactive element



# OCCURRENCE

- Since the group 2A elements are relatively active metals, they occur in compounds in nature.
- Magnesium, Mg
- The principal useful ores of magnesium are dolomite ( $\text{CaCO}_3 \cdot \text{MgCO}_3$  a double salt), carnallite, ( $\text{KCl} \cdot \text{MgCl}_2 \cdot 6\text{H}_2\text{O}$ ) and epsom salt ( $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$ ) which is found in mineral water.



## Calcium, Ca

- Calcium compounds are widely distributed in nature, occurring as limestone or marble ( $\text{CaCO}_3$ ), gypsum ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ) and fluorite ( $\text{CaF}_2$ ). Salts of sulfate, silicate and phosphate are also found in the earth's crust.



# Reactions

1) All alkaline earth metals, except beryllium, react with H<sub>2</sub> gas in hot medium to produce hydrides, like alkali metals.



2) Ca, Sr and Ba react with water, like alkali metals, at room temperature to produce metal hydroxides and hydrogen gas.



- Magnesium metal reacts slowly with boiling water.
- The reaction of beryllium with water is very difficult.

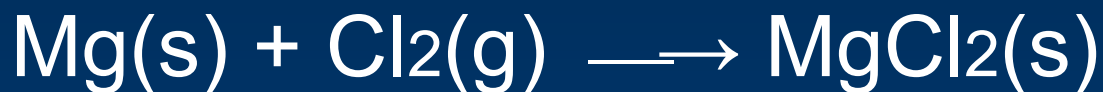
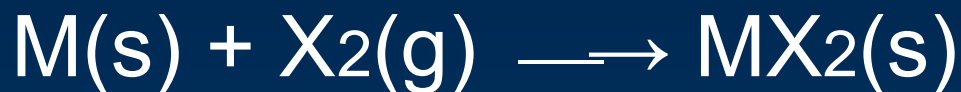




- 3. They form oxides as a result of their reactions with oxygen, in MO formula



- 4. All alkaline earth metals give direct reactions with halogens to produce metal halides.





5. The reactions of the group 2A elements with acids like HCl and H<sub>2</sub>SO<sub>4</sub>, produce salts and H<sub>2</sub> gas.



- While magnesium reacts with dilute H<sub>2</sub>SO<sub>4</sub> by giving H<sub>2</sub> gas, it reacts with hot and concentrated H<sub>2</sub>SO<sub>4</sub> by producing SO<sub>2</sub> gas.



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# COMPOUNDS

Formula	Common name	Uses
MgO		In lining of oven to manufacture rubber and dye
Mg(OH) <sub>2</sub>	Milk of magnesia	In medicine as anti-acid
MgSO <sub>4</sub> ·7H <sub>2</sub> O	Epsom salt	In manufacture of dye
CaSO <sub>4</sub> ·2H <sub>2</sub> O	Gypsum	In buildings
CaSO <sub>4</sub> ·1/2H <sub>2</sub> O	Plaster of Paris	In manufacture of gypsum
CaO	Lime	In manufacture of cement and casting
CaC <sub>2</sub>	Carbide	In welding
CaCO <sub>3</sub>	Limestone	In buildings
Ca(OH) <sub>2</sub>	Limewater	In plasters
BaO <sub>2</sub>		In manufacture of paper and dye
BaSO <sub>4</sub>	Baryte	In X-ray photography
Sr(NO <sub>3</sub> ) <sub>2</sub>		In fireworks as red color

**Table 4** Uses of some compounds of alkaline earth metals