Chemical properties :

1. **Reactivity :** It increases from Be to Ba. Be does not liberate H_2 from dil. acids and H_2O. All others liberate H_2 from dil. acids and water.
2. **Reducing nature:** They are good reducing agents due to higher SOP values. But less reducing when compared to IA group elements. Reducing nature increases from Be to Ba.
3. **Oxides and Hydroxides :**

- At low temperature they form oxides (MO) and at high temperature they could form peroxides (MO_2).
- The stability and ease of formation of peroxides increases from Be to Ba.
- The hydroxides on neutralisation with H_2O_2 will give peroxides $Ca(OH)_2 + H_2O_2 + 6H_2O \rightarrow CaO_2.8H_2O$
- BeO is amphoteric and others are basic. The basic nature and solubility of oxides and hydroxide will increase down the group.
- They are less basic than those of IA group.

4. **Carbonates and bicarbonates :**

- Alkaline earth metal carbonates are less stable and decompose easily when compared to alkali metal carbonates.
- Their bicarbonates exist only in solution while the bicarbonates of IA group exist in solid state.
- The thermal stability of carbonates increases form $BeCO_3$ to $BaCO_3$.
- The solubility of carbonates decreases from $BeCO_3$ to $BaCO_3$.

5. **Halides :**

i) Alkaline earth metals combine directly to give metals halides.

ii) The alkaline earth metals (or) the hydroxides (or) the carbonates react with halogen acids to form corresponding halides.

iii) Except beryllium halides, all other halides of this group are ionic compounds.

iv) Ionic nature of halides increases from Be to Ba.

v) Except BeX_2, the halides of other elements of this group or good conductors.

vi) The solubility of halides decreases from Be to Ba.

vii) The melting points and conductivities increases from top to bottom.

viii) Except BeF_2, other fluorides of this group are insoluble.

ix) The decrease in the solubility of halides down the group is due to decrease in hydration energy.

x) The halides of II A group metals are hygrosopic and forms hydrates readily.

xi) Anhydrous $CaCl_2$ is strong dehydrating agent and it is called laboratory desiccant.

6. Hydrides :

i) All alkaline earth metals form hydrides of the type MH_2

ii) BeH_2 and MgH_2 are covalent and other hydrides are ionic.

iii) In all the hydrides the oxidation state of H is –1 and H_2 is liberated at anode during the electrolysis of hydrides.

iv) The stability of hydrides decreases from Be to Ba.

7. Anomolous behaviour of beryllium :

i) Be differs from the rest of the alkaline earth metals due to a) its small size. b) high E.N. c) high polarizing power.

ii) Because of its high polarizing power, Be forms covalent compounds.

Ex: $BeCl_2$, BeO etc are covalent.

iii) It shows some similarities with 'A' due to diagonal relationship.