s-Block Elements

Physical properties of s-block elements

Physical State

ALKALI METAL	ALKALINE EARTH METAL
• One electron in outermost shell & **General formula ns^1** • Francium is radioactive element. • All are silvery white • Light soft, malleable and ductile metals with metallic luster. • Alkali metals are paramagnetic diamagnetic and colorless in form of ions.	• Two electrons in outer most shell & **General formula ns^2** • Radium is radioactive element. • All are grayish white. • These metals are harder than alkali metals • These are diamagnetic and colorless in form of ions or in metal states.

Atomic Size

ALKALI METAL	ALKALINE EARTH METAL
• Biggest in their respective period (except noble gas element) • Size increases from Li to Fr due to addition of an extra shell. Li < Na < K < Rb < Cs < Fr	• Smaller than IA group elements, since extra charge on nucleus attracts the electron cloud. • Size increases gradually from Be to Ra. Be < Mg < Ca < Sr < Ba **In s-block elements :** Be is the smallest, Cs is the biggest

Formation of amalgam

ALKALI METAL	ALKALINE EARTH METAL
• Alkali metals give amalgam with Hg. • These metals react with other metals to give mixed metals (alloys)	• Shows same properties.

Sulphates

ALKALI METAL	ALKALINE EARTH METAL
• Alkali metals forms M_2SO_4 type sulphates. • All alkali metal sulphates are ionic. Ionic properties increase from Li to Cs. $Li_2SO_4 < Na_2SO_4 < K_2SO_4 < Rb_2SO_4 < Cs_2SO_4$ • Li_2SO_4 is least soluble in water. • These sulphates on burning with C forms suphides $M_2SO_4 + 4C \longrightarrow M_2S + 4CO$ • Except lithium, sulphates of IA group reacts with sulphates of trivalent metals like Fe^{+3}, Cr^{+3}, Al^{+3} etc. gives double salts called alum. I III $M_2SO_4.M_2(SO_4)_3.24H_2O$	• Alkaline earth metals forms MSO_4 type sulphates. • Ionic nature of alkaline metal sulphate increased from Be to Ba. $BeSO_4 < MgSO_4 < CaSO_4 < SrSO_4 < BaSO_4$ • Solubility decreases from $BeSO_4$ to $BaSO_4$ as Be^{+2} and Mg^{+2} are of small size so their hydration energy is high Hydration Energy > Lattice Energy • Order of solubility – $BeSO_4 > MgSO_4 > CaSO_4 > SrSO_4 > BaSO_4$ • Order of thermal stability – $BeSO_4, MgSO_4, CaSO_4, SrSO_4, BaSO_4 \longrightarrow$ -Ionic nature increases -Thermal stability increases