

Q3: why lithium form monoxide, Na form peroxide and other metal forms superoxide? 2

Ans: It is because of the size of the cation. Small size of the cation is stabilised by small size of anion and vice-versa. Size of lithium ion is very small, so two lithium ion stabilise one oxide ion and form monoxide whereas size of potassium is very large so it is stabilised by two oxygen atoms.

2. Nature of Oxides:-

All alkali metal oxide are basic in nature because on dissolving in water, base is produced.

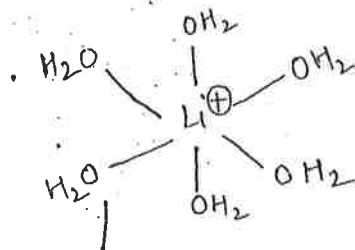
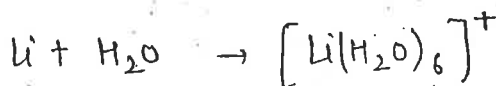
3. Reaction with water:-

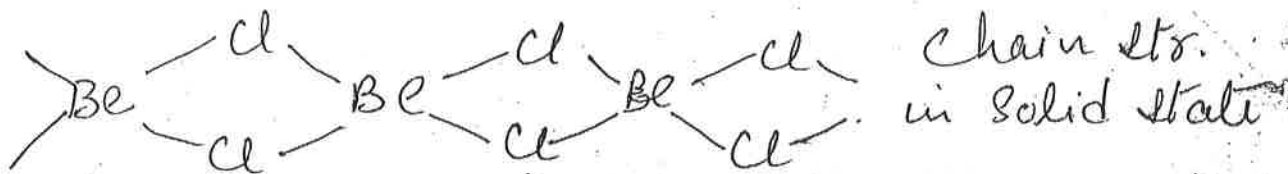
Q Sodium is stored in kerosene oil not in water. Why?

Ans: Sodium reacts with water and produces NaOH with the release of Hydrogen gas. This reaction is highly exothermic, bulk amount of energy is released. That's why, it catches fire and not stored in water.



Lithium's reaction with water is less vigorous in comparison to sodium it is because of very small size and very large hydration enthalpy of lithium. It is surrounded by H_2O molecules and produce bulk amount of energy but do not react with H_2O .





c) Salts of oxoacids:-

a) Carbonates:- (i) Alkaline earth metal carbonates are insoluble in water and their solubility decreases with the increasing atomic number of the metal ion.

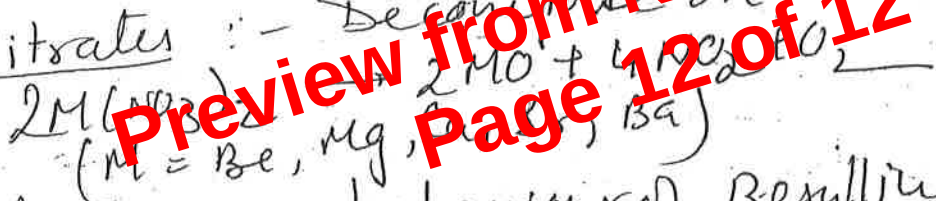
(ii) Carbonates decompose on heating to form an oxide and CO_2 is released.

(iii) Beryllium carbonate is unstable and should be kept in the atmosphere of CO_2 .

b) Sulphates:- stable to heat

Solubility decreases from CaSO_4 to BaSO_4 . BeSO_4 and MgSO_4 are readily soluble in water because hydration enthalpies of Be^{2+} and Mg^{2+} overcome the lattice enthalpy.

c) Nitrates:-



Anomalous behaviour of Beryllium

Reasons a) exceptionally small atomic and ionic sizes.

b) high ionisation enthalpy

c) d -orbital not available maximum co-ordination number 4 as its valence shell has only 4 orbitals.

d) oxides and hydroxides of beryllium are amphoteric in nature.

Diagonal relationship between Beryllium and Aluminium.