High Order Thinking Skills (HOTS) Questions

(1 mark each)

Q.1. Why second ionization energy of group 2 elements is less than group 1 elements? [DDE, 2017-18]

Ans. Second ionization energy of group 2 elements is less than group 1 elements because more energy is required to release second electron from alkali metals. $i.e$ group 1 metal ions.

Q.2. Sodium fire in the laboratory should not be extinguished by pouring water. Why? [KVS, 2014-15]

Ans. Sodium fire should not be extinguished in laboratory by pouring water because sodium produces hydrogen gas with water which catches fire due to exothermic nature of the reaction.

Q.3. Explain, why pallets of NaOH and KOH become wet when exposed to air.

Ans. It is because of the fact that both NaOH and KOH are highly deliquescent. These compounds absorb moisture from air and changes into solution.

Q.4. $\mathbf{BeCl_2}$ can be easily hydrolysed, why?

Ans. $\mathrm{BeCl_2}$ is electron deficient species so it can be easily hydrolysed.

$$\mathrm{BeCl_2 + 4H_2O \rightarrow [Be(H_2O)_4]Cl_2}$$

Q.5. How does the basicity of oxides of group 2 increases down the group?

Ans. The basicity of oxides of group 2 increases down the group because of decrease in polarizing power with increase in ionic size.

Q.6. A piece of magnesium ribbon continues to burn in $\mathbf{SO_2}$. Why? [DDE, 2017-18]

Ans. Magnesium is a strong reducing agent. It reduces $\mathrm{SO_2}$ to Sulphur. The reaction is highly exothermic so a piece of magnesium ribbon continues to burn in $\mathrm{SO_2}$.

$$\mathrm{2Mg + SO_2 \rightarrow 2MgO + S + heat}$$