CBSE TEST PAPER 02

CLASS XI CHEMISTRY (The s-Block Elements)

General Instruction:

- All questions are compulsory.
- Marks are given along with each question.

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1. Why alkali metal hydroxides are the strongest of all bases? [1]

2. Why the stability of peroxides and super oxides of alkali metals increases as the size of the metal ion increases? [1]

3. Give reasons for the anomalous properties of lithium. [2]

4. Why are lithium compounds soluble in organic solvents? [1]

5. Name the alkali metals that form super oxides when heated in excess of air. [2]

6. Write a reaction to show that large cations stabilize large anions. [1]

7. Why lithium shows similarities with magnesium. [1]

8. Why metals like potassium and sodium can not be extracted by reduction of their oxides by carbon? [2]

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CLASS XI CHEMISTRY (The s-Block Elements)

[ANSWERS]

Ans 1. The alkali metal hydroxides are the strongest of all bases because they dissolve freely in water and ionize completely.

Ans 2. The stability of peroxides and super oxides of alkali metals increases as the size of the metal ion increases, due to the stabilization of large anions by larger cations through lattice energy effects.

Ans 3. The anomalous properties of lithium is due to:

(i) Exceptionally small size of its atom and ion.

(ii) High polarising power (i, e; charge / radius radio).

Ans 4. Due to high polarizing power, lithium compounds have more covalent character, which is responsible for their solubility in organic solvents.

Ans 5. Potassium, rubidium and caesium form super oxides when heated in excess of air.

Ans 6. The large superoxide O^{2-} ion is stable only in the presence of large cations such as K, Rb, Cs.

$K + O_2 \rightarrow KO_2$

Ans 7. Lithium shows similarities with magnesium because of their similar sizes.

Ans 8. Potassium and sodium are strong electropositive metals and have great affinity for oxygen than that of carbon. Hence they Cannot be extracted from their oxides by reduction with carbon.