

CHEMISTRY-2

s-Block Elements

[Set-2]

SECTION-A

- Which of the following has the smallest ionic radius?
 (i) Li^+ (ii) Na^+ (iii) Ba^{2+} (iv) Be^{2+}
- The covalency of beryllium in solid beryllium chloride is
 (i) 1 (ii) 2 (iii) 3 (iv) 4
- Which of the following metal carbonate dissolves in water to give most basic solution?
 (i) Na_2CO_3 (ii) BeCO_3 (iii) MgCO_3 (iv) K_2CO_3
- Which of the following metal does not form peroxide?
 (i) Be (ii) Na (iii) K (iv) Ba

5. Match the following:

Column-I

- A. Lithium
 B. Potassium
 C. Beryllium
 D. Barium

Column-II

1. Amphoteric oxide
 2. Apple green flame
 3. Photoelectric effect
 4. Form nitride

	A	B	C	D
(i)	(3, 4)	3	(1, 4)	2
(ii)	(1, 4)	2	2	3
(iii)	4	3	1	2
(iv)	4	3	(1, 4)	2

Assertion-Reason type Questions:

- (a) Both A and R are true and R is the correct explanation of A
 (b) Both A and R are true and R is not the correct explanation of A
 (c) A is true but R is false
 (d) A is false but R is true

6. A: Potassium reacts with oxygen to form KO_2
 R: In KO_2 , the oxidation state of potassium is +4
7. A: MgCl_2 is ionic and exists as a hydrated salt $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$
 R: $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$ on strong heating gives MgCl_2 .

Passage based questions

Sodium and potassium are highly reactive metals and exists in the combined state in the earth crust. Both sodium and potassium reacts with oxygen, hydrogen and halogen and form variety of compounds. Sodium and potassium form their oxosalts which are commercially important. Sodium hydrogen carbonate is used as an antacid to neutralize the excess HCl in the stomach.

Sodium and potassium both are monovalent and are found in large proportions in biological fluids. Sodium ions are found primarily outside of cells whereas potassium ions are found inside the cell fluid. Sodium ions along with the potassium ions are responsible for the transmission of nerve signals. Sodium maintains the electrolyte balance in the body whereas potassium ions maintains osmolarity of the cell. They also regulate the opening and the closing of the stomata.

8. Which of the following is the most covalent halide?
 (i) LiCl (ii) LiI (iii) NaCl (iv) KBr
9. Which of the following statement is incorrect?
 (i) In blood plasma, sodium is present to the extent of 143 m mol/L and potassium level is only 5 m mol/L within red blood cells.
 (ii) Potassium ions are the most abundant cations within cell fluids
 (iii) Sodium-potassium pump, operates across the cell membranes which consumes about 15 kg per 24 hours in a resting human
 (iv) Sodium ions are found primarily inside the cells, located in blood plasma.
10. Each of the following statements is correct except
 (i) Sodium hydride on hydrolysis gives an alkaline solution
 (ii) The melting points of alkali metal halides following the order
 $\text{MF} > \text{MCl} > \text{MBr} > \text{MI}$
 (iii) As the electropositive character increases down the group, the stability of carbonates and hydrogen carbonates decreases
 (iv) Lithium is the strongest reducing agent in group 1

SECTION-B

11. Give reason:

- (i) Li_2CO_3 decomposed at a lower temperature whereas Na_2CO_3 at higher temperature
- (ii) Lithium salts are commonly hydrated and those of the other alkali ions are usually anhydrous.

12. How would you explain the following observations?

- (i) BeO is almost insoluble but BeSO_4 is soluble in water
- (ii) LiI is more soluble than KI in ethanol

OR

Write balanced equations for the reactions between

- (i) Na_2O_2 and water
- (ii) KO_2 and water

13. How is BeCl_2 prepared?

Draw the structure of (i) BeCl_2 at high temperature and (ii) BeCl_2 solid

14. (i) Why can alkaline earth metals not be obtained by chemical reduction methods?
- (ii) What happens when (give balanced chemical equation only)
- (a) chlorine reacts with slaked lime
 - (b) quick lime is heated with Silica

OR

Inorganic salt (A) on heating on flame give a brick red colour. 'A' on reaction with dilute H_2SO_4 gives a brisk effervescence due to liberation of a gas (B) Gas B turns the lime water milky, but the milkiness disappears when excess of CO_2 gas is passed due to formation of C.

What are A, B and C?

Write the balanced chemical equations for the reactions involved.

15. (i) What is Plaster of Paris? What happens when water is added to Plaster of Paris?
- (ii) Discuss the anomalous behavior of lithium and its diagonal relationship with magnesium.

OR

- (i) Give reason
 - (a) Beryllium from oxoanions
 - (b) sodium is less reactive than potassium
- (ii) Discuss the various reaction that occur in the preparation of sodium hydrogen carbonate by Solvay process