

The s block elements

SUBJECTIVE PROBLEMS:

Q 1.

Give reasons for the following

- (i) Sodium carbonate is made by Solvay process but the same process is not extended to the manufacture of potassium carbonate. (IIT JEE 1981 – 1 Marks)
- (ii) Hydrogen peroxide is a better oxidizing agent than water. (IIT JEE 1986 – 1 Marks)
- (iii) Magnesium oxide is used for the lining of steel making furnace. (IIT JEE 1987 – 1 Marks)
- (iv) Why is sodium chloride added during electrolysis of fused anhydrous magnesium chloride? (IIT JEE 1987 – 1 Marks)
- (v) Hydrogen peroxide acts as an oxidizing as well as a reducing agent. (IIT JEE 1992 – 1 Marks)
- (vi) The crystalline salts of alkaline earth metals contain more water of crystallization than the corresponding alkali metal salts. (IIT JEE 1997 – 2 Marks)
- (vii) BeCl_2 can be easily hydrolyses. (IIT JEE 1999 – 2 Marks)

Q 2.

How will you prepare bleaching powder from slaked lime (IIT JEE 1982 – 1 Marks)

Q 3.

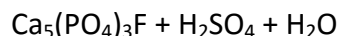
Write down the balanced equations for the reactions when:

- (i) Calcium phosphate is heated with a mixture of sand and carbon; (IIT JEE 1985 – 1 Marks)
- (ii) An alkaline solution of potassium ferricyanide is reacted with hydrogen peroxide. (IIT JEE 1982 – 1 Marks)
- (iii) Carbon dioxide is passed through a concentrated aqueous solution of sodium chloride saturated with ammonia. (IIT JEE 1988 – 1 Marks)
- (iv) Potassium ferricyanide reacts with hydrogen peroxide in basic solution. (IIT JEE 1989 – 1 Marks)
- (v) Carbon dioxide is passed through a suspension of lime stone in water. (IIT JEE 1991 – 1 Marks)

Q 4. Give briefly the isolation of magnesium from sea water by the Dow process. Give equations for the steps involved. (IIT JEE 1993 – 3 Marks)

Q 5.

Complete and balanced the following reactions:



Q 6.

A 5.0 cm³ solution of H₂O₂ liberates 0.508 g of iodine from an acidified KI solution. Calculate the strength of H₂O₂ solution in terms of volume strength at STP. (IIT JEE 1995 – 2 Marks)

Q 7.

Explain the difference in the nature of bonding in LiF and LiI. (IIT JEE 1996 – 2 Marks)

Q 8.

Write the reaction involved in manufacture of triple superphosphate from Fluor apatite. (IIT JEE 1997C – 1 Marks)

Q 9.

To a 25 ml H₂O₂ solution, excess of acidified solution of potassium iodide was added. The iodine liberated required 20 ml of 0.3 N sodium thiosulphate solution. Calculate the volume strength of H₂O₂ solution. (IIT JEE 1997 – 5 Marks)

Q 10.

Give reactions for the oxidation of hydrogen peroxide with potassium permanganate in acidic medium. (IIT JEE 1997 – 1 Marks)

Q 11.

Element A burns in nitrogen to give an ionic compound B. Compound B reacts with water to give C and D. A solution of C becomes 'milky' on bubbling carbon dioxide. Identify A, B, C and D. (IIT JEE 1997 – 3 Marks)

Q 12.

Arrange the following sulphates of alkaline earth metals in order of decreasing thermal stability. BeSO₄, MgSO₄, CaSO₄, SrSO₄ (IIT JEE 1997 – 1 Marks)

Q 13.

Work out the following using chemical equation: Chlorination of calcium hydroxide produces bleaching powder. (IIT JEE 1998 – 2 Marks)

Q 14.

Hydrogen peroxide acts both as an oxidizing and as a reducing agent in alkaline solution towards certain first row transition metal ions. Illustrate both these properties of H₂O₂ using chemical equations. (IIT JEE 1998 – 4 Marks)