

UNIT 10

s BLOCK ELEMENTS

Answer the questions. (1 Score each)

1. Dead burnt plaster is

Ans: anhydrous CaSO_4

2. Dilute solutions of alkali metal in Ammonia are.....magnetic in nature.

Ans: paramagnetic

3. Strongest reducing agent among alkali metals is

Ans : Li

4. The product obtained when quicklime is mixed with water is

Ans: Ca(OH)_2 or Slaked lime

5. Sodium carbonate is manufactured by

Ans: Solvay process

6. Soda Ash is

Ans: anhydrous Na_2CO_3

7. What is bleaching powder?

Ans: Calcium hypochlorite / Ca(OCl)_2 / Ca(OCl)Cl

Answer the questions. (2 Score each)

8. Alkali metals when dissolved in liquid Ammonia give deep blue solutions, why?

Ans: Alkali Metals when dissolved in Ammonia, metal ions and electrons gets associated with ammonia. These electrons are called ammoniated electrons or solvated electrons. The deep blue colour of the solution is due to these ammoniated electrons.

9. Give the characteristics of solution obtained by dissolving an alkali metal in liquid ammonia.

Ans:

1. If the solution is dilute, then it is
 - **deep blue in colour**
 - **paramagnetic in nature**
 - **Good conductors,**
2. If the solution is concentrated, then it is
 - **bronze coloured**
 - **diamagnetic in nature.**

10. Lithium shows anomalous properties. Why?

Ans: Due to its small size, high polarising power and non availability of "d" electrons.

11 . Write any two anomalous properties of lithium

Ans:

1. **Lithium forms only monoxide .**
2. **Lithium is much harder and has higher melting and boiling point than other alkali metals**

12. Solvay process cannot be used for the preparation of potassium carbonate. Give reason.

Ans: Solvay process cannot be used for the preparation of potassium carbonate(K_2CO_3) because potassium bicarbonate($KHCO_3$) is highly soluble in water that it does not get precipitated by adding NH_4HCO_3 .

13. What is setting of cement?

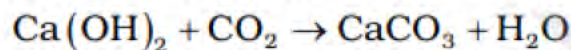
Ans: When mixed with water, the setting of cement takes place to give a hard mass. During this process the hydration of the silicates and aluminates occur and a large amount of heat is evolved.

14. What is the purpose of adding gypsum during cement manufacture?

Ans: The purpose of adding gypsum is to slow down the process of setting of the cement so that it gets sufficiently hardened.

15. When carbon dioxide is passed through lime water it turns milky, give reason.

Ans: **When carbon dioxide is passed through lime water it turns milky due to the formation of insoluble calcium carbonate.**



16. Write any two uses of Washing soda, Baking soda, Quick lime, Slaked lime, Limestone and Plaster of Paris.

1. Washing soda, sodium carbonate (Na_2CO_3)

- It is used in water softening ,laundrying and cleaning
- It is used as a laboratory reagent.

2. Baking soda, Sodium Bicarbonate (NaHCO_3)

- Mild antiseptic for skin infection
- It is used in fire extinguisher

3. Quick lime (CaO)

- It is an important primary material for the manufacture of cement
- It is used in the purification of sugar

4. Slaked lime Ca(OH)_2

- It is used in whitewashing due to its disinfectant nature
- It is used in glass making, tanning and for purification of sugar

5. Limestone, calcium carbonate (CaCO_3)

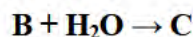
- It is used as a building material in the form of marble
- Calcium carbonate is used as a flux in the extraction of metals.

6. Plaster of Paris ($\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$)

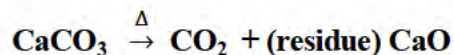
- It is used in building industry as well as plasters.
- It is used in dentistry, in ornamental work and for making statues

17. **A** on heating gives **B**, which on reaction with water gives **C**. Very clear solution of **C** known as lime water. Identify **A**, **B** and **C**

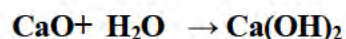
Ans: The reactions can be summarized as follows :



This is possible only when if A is $CaCO_3$. The reactions are as follows



So B is CaO.



So C is Calcium Hydroxide.

Thus, calcium carbonate on heating gives colourless gas carbon dioxide and residue calcium oxide. Calcium oxide reacts with water to form calcium hydroxide.

Answer the questions. (3 Score each)

18. Match the following

- | | |
|---------------------------|---------------------|
| 1. $CaSO_4 \cdot 1/2H_2O$ | A) Limestone |
| 2. $CaCO_3$ | B) Quick lime |
| 3. Na_2CO_3 | C) Slaked lime |
| 4. $NaHCO_3$ | D) Washing soda |
| 5. CaO | E) Baking soda |
| 6. $Ca(OH)_2$ | F) Plaster of Paris |

Ans:

1-F 2-A 3-D 4-E 5-B 6-C

19. Explain solvay process.

Ans: Solvay process is used for the manufacture of sodium carbonate (Na_2CO_3). In this process carbon dioxide gas is passed through concentrated sodium chloride (NaCl) solution saturated with Ammonia (NH_3). Ammonium carbonate ($(NH_4)_2CO_3$) first formed is converted to ammonium bicarbonate (NH_4HCO_3) and finally react with NaCl to form Sodium bicarbonate ($NaHCO_3$). Sodium bicarbonate crystals are separated and heated to get sodium carbonate .

