

## CASE STUDY BASE QUESTIONS

**Q.1** A chemical reaction is a representation of chemical change in terms of symbols and formulae of reactants and products. There are various types of chemical reactions like combination, decomposition, displacement, double displacement, oxidation and reduction reactions. Reactions in which heat is released along with the formation of products are called exothermic chemical reactions. All combustion reactions are exothermic reactions.

**Q1.1** Define decomposition reaction.

**Answer:** The chemical reaction in which a single substance breaks down into two or more simpler substances upon heating is known as thermal decomposition reaction.

**Q1.2. A white salt on heating decomposes to give brown fumes and yellow residue is left behind. The yellow residue left is of which chemical?**

**Answer:** Lead nitrate decomposes to give brown fumes of nitrogen dioxide gas and yellow residue of lead oxide is left behind.

**Q1.3. Give an example of a combination reaction?**

**Answer:**  $\text{CaO (s)} + \text{H}_2\text{O (l)} \rightarrow \text{Ca(OH)}_2 \text{ (aq)}$

**Q1.4. Complete the following statements by choosing correct type of reaction for X and Y.**

**Statement 1:** The heating of lead nitrate is an example of 'X' reaction.

**Statement 2:** The burning of magnesium is an example of 'Y' reaction.

**Answer-** X- Decomposition, Y-Combination

Heating of lead nitrate to form nitrogen dioxide and lead oxide is an example of thermal decomposition reaction and the burning of magnesium ribbon in the air to form magnesium oxide is an example of combination reaction.

**Q.2** A solution of slaked lime produced by the reaction is used for white washing walls. Calcium hydroxide reacts slowly with the carbon dioxide in air to form a thin layer of calcium carbonate on the walls. Calcium carbonate is formed after two to three days of white washing and gives a shiny finish to the walls. It is interesting to note that the chemical formula for marble is also  $\text{CaCO}_3$ .

**2.1. Give the reaction for the formation of calcium carbonate with physical states.**

**Answer-**  $\text{Ca(OH)}_2\text{(s)} + \text{CO}_2\text{(g)} \rightarrow \text{CaCO}_3\text{(s)} + \text{H}_2\text{O(l)}$

**2.2 Write any one application of calcium carbonate other than white washing.**

**Answer-** Calcium carbonate is also used in the production of antacids and can also be used to increase the levels of calcium in body.

**2.3 Why calcium carbonate is used for white washing and not any other substance.**

**Answer-** Calcium carbonate is used for whitewashing as it produces a shiny film whilst the production of carbon dioxide and act as hard coating for the walls.

**2.4 Write the formulas of slaked lime and quick lime.**

**Answer-** Slaked lime: Calcium hydroxide is called as slaked lime with a formula of:

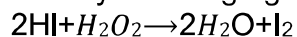
$\text{Ca(OH)}_2$ , whereas calcium oxide is called as quick lime with a formula of :  $\text{CaO}$

**Q.3** Redox reactions are those reactions in which oxidation and reduction occur Simultaneously. A redox reaction is made up of two half reactions. In the first half reaction, oxidation takes place and in second half reaction, reduction occurs. Oxidation is a process in which a substance loses electrons and in reduction, a substance gains electron. The substance which gains electrons is reduced and acts as an oxidizing agent. On the other hand, a substance which loses electrons is oxidized and acts as a reducing agent.

**3.1** What is a redox reaction?

**Answer-** A reaction in which both oxidation and reduction takes place simultaneously is termed as redox reaction.

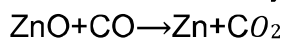
**3.2** Identify reducing agent and substance oxidized in the given reaction



**Answer-** Reducing agent-  $\text{H}_2\text{O}_2$

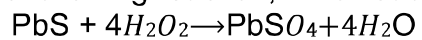
Substance oxidised -  $\text{H}_2\text{O}_2$

3.3. In the given reaction, identify the substance reduced and oxidising agent.



Answer- A- $\text{ZnO}$  is reduced to  $\text{Zn}$  and  $\text{Zn}$  is oxidising agent

3.4. In the following reaction, which substance is reduced and which is reduced?



Answer-  $\text{H}_2\text{O}_2$  is reduced and  $\text{PbS}$  is oxidised.

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