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Answers Key:

Case Study Questions

1. (i) (d) : $PQ \longrightarrow P + Q$
   35 g 20 g + ?
   According to law of conservation of mass, Mass of PQ = Mass of P + Mass of Q
   ∴ Mass of Q = (35 - 20)g = 15 g
   (ii) (d) : $2HgO_{(s)} \longrightarrow 2Hg_{(l)} + O_{2(g)}$
   (iii) **(b)**
   (iv) **(b)**
   (v) **(b)**
2. (i) **(a)** combination reaction
   (ii) **(d)** Both 'a' and 'b'
   (iii) **(b)** photodecomposition
   (iv) (a) $C_{(s)} + O_{2(g)} \longrightarrow CO_{2(g)}$
   (v) **(d)** All of them

5 Marks

3. (i) Rancidity: Fat and oil containing food when kept open in air gets oxidised and become rancid due to which the taste and smell of food changes.
   (ii) Two methods to reduce rancidity are keep the food in closed containers and use antioxidants.
   (iii) Corrosion is seen in all metals, when kept exposed. Forms a layer of compound by reaction of metal with moisture, acid or gases present in it. Rusting is the process in which iron metal reacts with air and moisture to form brownish powder called rust.
4. (i) When the student mixed sodium sulphate powder in barium chloride in a dry state, no change would be observed. But when he dissolved them in water, barium sulphate precipitates out and sodium chloride remains in solution. This is called a double displacement reaction.
   (ii) (a) Copper < iron < zinc < aluminium

3 Marks

5. (a) (i) $Ca(OH)_2 + CO_2 \longrightarrow CaCO_3 + H_2O$
   (ii) $Ca(OH)_2(aq) + CO_2(g) \longrightarrow CaCO_3(s) + H_2O(I)$
   $CaCO_3(s) + H_2O(I) + CO_2(g) \longrightarrow Ca(HCO_3)_2(aq)$
   (b) Aragonite and calcite
6. (i) $BaCl_2 + H_2SO_4 \longrightarrow BaSO_4 + 2HCl$
   (ii) $Ca(OH)_2 + 2HNO_3 \longrightarrow Ca(NO_3)_2 + 2H_2O$
   (iii) $2\ Pb(NO_3)_2 \longrightarrow 2PbO + 4NO_2 + O_2$
   (iv) $MnO_2 + 4HCl \longrightarrow MnCl_2 + 2H_2O + Cl_2$

2 Marks

7. (a) When magnesium is heated in oxygen of air, it leaves white powder of magnesium oxide which dissolves in water. The magnesium oxide being alkaline in nature turns red litmus to blue. Also, the metal in ribbon form is Magnesium [Mg]. Thus 'X' is identified ad magnesium and 'Y' is identified as magnesium oxide.
   (b)The chemical reaction is:
   $2Mg(s)+O_2(g) \rightarrow 2MgO$

Multiple Choice Question

8. (a) Hydrogen gas and Iron chloride are produced.