Class Assignment

Competency Based questions

1. Why should a magnesium ribbon be cleaned before burning in air ?
Answer:
Magnesium gets covered with a layer of magnesium oxide when kept in air for a long time. This layer hinders the burning of magnesium. Hence, it is to be cleaned before burning.

2. Write the balanced equation for the following chemical reactions.
(i) Hydrogen + Chlorine → Hydrogen chloride
(ii) Barium chloride + Aluminium sulphate → Barium sulphate + Aluminium chloride
(iii) Sodium + Water → Sodium hydroxide + Hydrogen
Answer:
(i) $H_2 + Cl_2 \rightarrow 2HCl$
(ii) $3\ BaCl_2 + Al_2(SO_4)_3 \rightarrow BaSO_4 + 2\ AlCl_3$
(iii) $2Na + 2H_2O \rightarrow 2NaOH + H_2\uparrow$

3. Why does the colour of copper sulphate solution change when an iron nail is dipped in it ?
Answer:
When an iron nail is dipped in copper sulphate solution, the displacement reaction takes place. The colour of copper sulphate solution fades due to the formation of light green solution of iron sulphate.

$$Fe(s) + \underset{\text{(Blue solution)}}{CuSO_4(aq)} \longrightarrow \underset{\text{(Greenish solution)}}{FeSO_4(aq)} + Cu(s)$$

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4. What does one mean by exothermic and endothermic reactions ? Give examples.

Answer:

Exothermic reactions : Those reactions in which heat is evolved are known as exothermic reactions. An exothermic reaction is indicated by writing "+ Heat"on the products side of an equation.

Example :

(i) C (s) + O2 (g) → CO2 (g) + Heat

(ii) $N_2 (g) + 3H_2 (g) \rightarrow 2NH_3 (g) + Heat$

Endothermic reactions : Those reactions in which heat is absorbed are known as endothermic reactions. An endothermic reaction is usually indicated by writing "Heat" on the product side of a chemical equation.

Examples :

$$\underset{\text{Water}}{2H_2O\,(l)} \xrightarrow[\text{(decomposition)}]{\text{Electricity}} 2H_2\,(g) + O_2\,(g)$$

(i) $C (s) + 2S (s) \rightarrow CS_2 (l) - Heat$

(ii) $N_2 (g) + O_2 (g) \rightarrow 2NO(g) - Heat$

5. Why are decomposition reactions called the opposite of combination reactions? Write equations for these reactions.

Answer:

In a decomposition reaction, a single compound breaks down to produce two or more simpler substances.

For example:

6. Explain the following in terms of gain or loss of oxygen with two examples each:

(a) Oxidation and

(b) Reduction.

Answer:

(a) Oxidation : The addition of oxygen to a substance is called oxidation.

Example :

(i) $S(s) + O_2(g) \rightarrow SO_2(g)$ (Addition of oxygen to sulphur)

(ii) $2Mg(s) + O_2 (g) \rightarrow 2MgO(s)$ (Addition of oxygen to magnesium)

(b) Reduction : The removal of oxygen from a substance is called reduction.

Example: (i) $CuO + H_2 \xrightarrow{Heat} Cu + H_2O$

Here, copper oxide is being reduced to copper because oxygen gets removed from copper oxide.

(ii) $ZnO + C \rightarrow Zn + CO$

Here, zinc oxide is being reduced to zinc because oxygen gets removed from zinc oxide.

7. A shiny brown coloured element 'X' on heating in air becomes black in colour. Name the element 'X' and the black coloured compound formed.

Answer:

Element 'X' is copper (Cu).

The black coloured compound is copper oxide (CuO). The reaction involved is oxidation.