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Solution 46:

- (a) Lead nitrate.
- (b) Lead iodide.
- (c) Formation of a precipitate.
- (d) $\text{Pb}(\text{NO}_3)_2 (\text{aq}) + 2\text{KI} (\text{aq}) \rightarrow \text{PbI}_2 (\text{s}) + 2\text{KNO}_3 (\text{aq})$

Solution 47:

- (a) Calcium oxide, CaO .
- (b) Calcium hydroxide, $\text{Ca}(\text{OH})_2$
- (c) Lime water.
- (d) $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2$
- (e) Change in temperature.

Solution 48:

- (a) Zinc and Iron.
- (b) Dilute hydrochloric acid and dilute sulphuric acid.
- (c) Hydrogen.
- (d) Lighter than air.
- (e) Exothermic.
- (f) Suppose metal X is zinc (Zn) and acid Y is dilute hydrochloric acid (HCl) ;
 $\text{Zn} (\text{s}) + 2\text{HCl} (\text{aq}) \rightarrow \text{ZnCl}_2 (\text{aq}) + \text{H}_2 (\text{g})$

Solution 49:

- (a) Calcium carbonate (limestone), CaCO_3
- (b) Calcium oxide, CaO
- (c) Carbon dioxide, CO_2
- (d) Calcium hydroxide, $\text{Ca}(\text{OH})_2$; Lime water.
- (e) Calcium carbonate; Limestone and Marble.

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Solution 50:

- (a) Magnesium, Mg.
- (b) Magnesium oxide, MgO
- (c) Oxygen (of air), O_2
- (d) Magnesiumhydroxide, $\text{Mg}(\text{OH})_2$; Used as antacid to relieve indigestion
- (e) $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$

Solution 51:

- (a) Copper, Cu.
- (b) Copper sulphate, CuSO_4 , Blue colour.
- (c) Copper hydroxide, $\text{Cu}(\text{OH})_2$
- (d) $\text{CuSO}_4 (\text{aq}) + 2\text{NaOH} (\text{aq}) \rightarrow \text{Cu}(\text{OH})_2 (\text{s}) + \text{Na}_2\text{SO}_4 (\text{aq})$

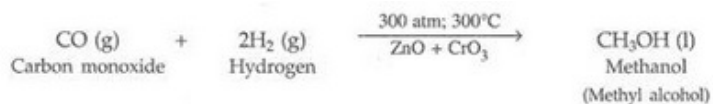
Solution 52:

- (a) Sodium, Na.
- (b) Sodium hydroxide solution (NaOH solution), Alkaline.
- (c) Hydrogen, H_2
- (d) $2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$
- (e) Exothermic.

Solution 53:

- (a) X is carbon monoxide gas (CO); Y is hydrogen gas (H_2) ; Z is methanol (or Methyl alcohol) (CH_3OH)
($\text{CH}_4\text{O} = \text{CH}_3\text{OH}$)

(b) Formation of Z:



The conditions for this reaction to take place are: a pressure of 300 atmospheres (written as 300 atm), a temperature of 300°C, and a catalyst which is a mixture of zinc oxide and chromium oxide (ZnO + CrO₃).

Solution 54:

- (a) Potassium chlorate, KClO₃
- (b) Potassium chloride, KCl
- (c) Oxygen, O₂
- (d) Manganese dioxide, MnO₂; It acts as a catalyst in the decomposition of potassium chlorate to form oxygen gas
- (e) Catalysts

Solution 55:

- (a) Carbon dioxide, CO₂
- (b) Water, H₂O
- (c) Sunlight.
- (d) Chlorophyll; Green leaves of plants.
- (e) Glucose, C₆H₁₂O₆
- (f) Oxygen; Photosynthesis.

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