TENDER HEART HIGH SCHOOL, SEC-33B, CHD — 14.07.2024

CLASS- IX — SUBJECT- CHEMISTRY

CHAPTER-9 — TEACHER- ANAMIKA

CH-9 (Practical Work)

Recognition And Identification Of Gases

1. Hydrogen

Recognition and Identification of gas.

1. The gas evolved is colourless and odourless
2. It is neutral to litmus.
3. When a burning splint is brought near it pure hydrogen burns with a pale blue flame

$$2H_2 + O_2 \rightarrow 2H_2O$$

4. Hydrogen mixed with air burns with a pop sound when a burning taper is brought near it.

2. Oxygen

Preparation :- Heat heavy metallic oxides

Heavy metal oxide $\xrightarrow{\Delta}$ Metal oxide / Metal + Oxygen

$$2Pb_3O_4 \xrightarrow{\Delta} 6PbO + O_2\uparrow$$

$$2PbO_2 \xrightarrow{\Delta} 2PbO + O_2\uparrow$$

(P.T.O)

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Recognition and Identification of Gas

1. Gas is colourless, odourless and neutral to litmus.
2. It rekindles a glowing wooden splinter
3. The gas is absorbed in colourless alkaline solution of pyrogallol and turns it dark brown.

3 Carbon dioxide

Preparation:- Heat metallic carbonate (except sodium carbonate & potassium carbonate) or add dilute acid to any carbonate or hydrogen carbonate

Metallic carbonate $\xrightarrow{\Delta}$ Metal oxide + Carbon dioxide

$ZnCO_3 \xrightarrow{\Delta} ZnO + CO_2\uparrow$

$CuCO_3 \xrightarrow{\Delta} CuO + CO_2\uparrow$

Metal carbonate/hydrogen carbonate + Acid (dil) → Salt + Water + Carbon dioxide

$CaCO_3 + 2HCl \rightarrow CaCl_2 + H_2O + CO_2\uparrow$

$NaHCO_3 + HCl \rightarrow NaCl + H_2O + CO_2\uparrow$

Recognition & Identification of Gas

1. The gas is colourless and odourless
2. It turns moist blue litmus faint red.
3. When the gas is passed through lime water, it turns milky due to the formation of white ppt calcium carbonate.

$Ca(OH)_2 + CO_2 \rightarrow CaCO_3 \downarrow + H_2O$

4. The gas has no effect on litter paper dipped in acidified $K_2Cr_2O_7$ or $KMnO_4$.

4. Chlorine

Preparation: Add conc. HCl to oxidizing agents like Pb_3O_4, PbO_2, MnO_2, etc. & heat.

Oxidizing agent + Conc HCl → Metal chloride + Water + Chlorine

$Pb_3O_4 + 8HCl \rightarrow 3PbCl_2 + 4H_2O + Cl_2\uparrow$

$MnO_2 + 4HCl \rightarrow MnCl_2 + 2H_2O + Cl_2\uparrow$

Recognition & Identification of gas

1. The gas is greenish yellow with a sharp pungent choking odour.

9. It turns moist blue litmus paper red and finally bleaches, i.e decolourizes it.

$Cl_2 + H_2O \rightarrow HCl + HClO$

$HClO \rightarrow HCl + [O]$

Colouring matter + $[O]$ → Colourless or bleached product.

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3. It turns moist starch iodide paper (KI + starch solution) blue black.

$Cl_2 + 2KI \rightarrow 2KCl + I_2$
Starch + I_2 → Blue Black colour

4. Pass the gas through silver nitrate solution, a white ppt (of silver chloride) is formed

5. Hydrogen chloride

Preparation Add conc. H_2SO_4 to metal chlorides like (NaCl, KCl etc. and heat

Metal chloride + Conc. Sulphuric acid → Metal + Hydrogen sulphate chloride

$NaCl + H_2SO_4 \rightarrow NaHSO_4 + HCl\uparrow$
$KCl + H_2SO_4 \rightarrow KHSO_4 + HCl\uparrow$

Recognition & Identification of Gas
1. The gas is colourless & has a pungent choking odour.
2. The gas turns moist blue litmus paper red
3. If a rod dipped in ammonia solution is brought near the gas, dense white fumes of ammonium chloride are formed

(P.T.O)

$NH_3(aq) + HCl \rightarrow NH_4Cl$

4. When the gas is passed through silver nitrate solution, a white ppt of silver chloride is formed.

$AgNO_3(aq) + HCl \rightarrow AgCl\downarrow + HNO_3$

The ppt dissolves in excess NH_4OH

* (L.ND) *