only with pH range of 0 to 10. However above the pH 12 (high alkalinity), cations of the solution affect the glass and results the electrode useless.

Applications of ISES:

i) ISES are used in determining the concentrations of cations like H^+, Na^+, K^+, Ag^+, Li^+.

ii) ISES are used for the determination of hardness (Ca^{2+} and Mg^{2+} ions)

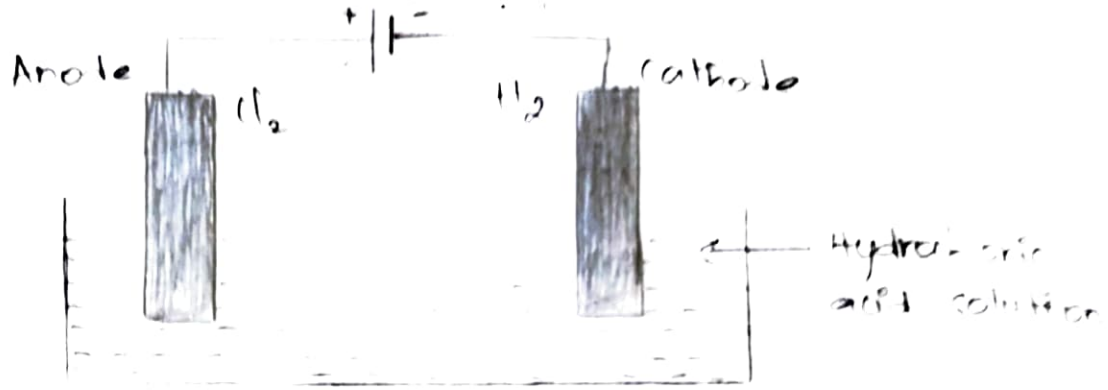
iii) Concentrations of anions like NO_3^-, CN^-, S^{2-}, halides (X^-) can be determined.

iv) ISES are used in the determination of concentration of a gas by using gas-sensing electrodes.

v) pH of the solution can be measured by using gas-sensing electrode.

Electrolysis:-

The chemical decomposition of an electrolyte caused by the passage of electricity is called electrolysis. Consider the electrolysis of an aqueous solution of HCl between two platinum electrodes. It is seen that hydrogen is evolved at the cathode and chlorine is evolved at the anode.



When HCl is dissolved in water, it dissociates into H^+ and Cl^- ions. On passing electric current, the H^+ ions will move towards the cathode and the Cl^- ions will move towards the anode.

At anode :- At the anode, the oxidation of chloride ions takes place to give chlorine.

$$2Cl^- \longrightarrow Cl_2 + 2e^-$$

Thus, the electrode at which the oxidation occurs is called the anode. The electrons lost to the anode are pumped by the battery to the cathode so that the reduction of H^+ ions can take place at the cathode.

At cathode :- Hydrogen ions get reduced at the cathode to give hydrogen.

$$2H^+ + 2e^- \longrightarrow H_2$$

Thus, the electrode at which reduction occurs is called the cathode.