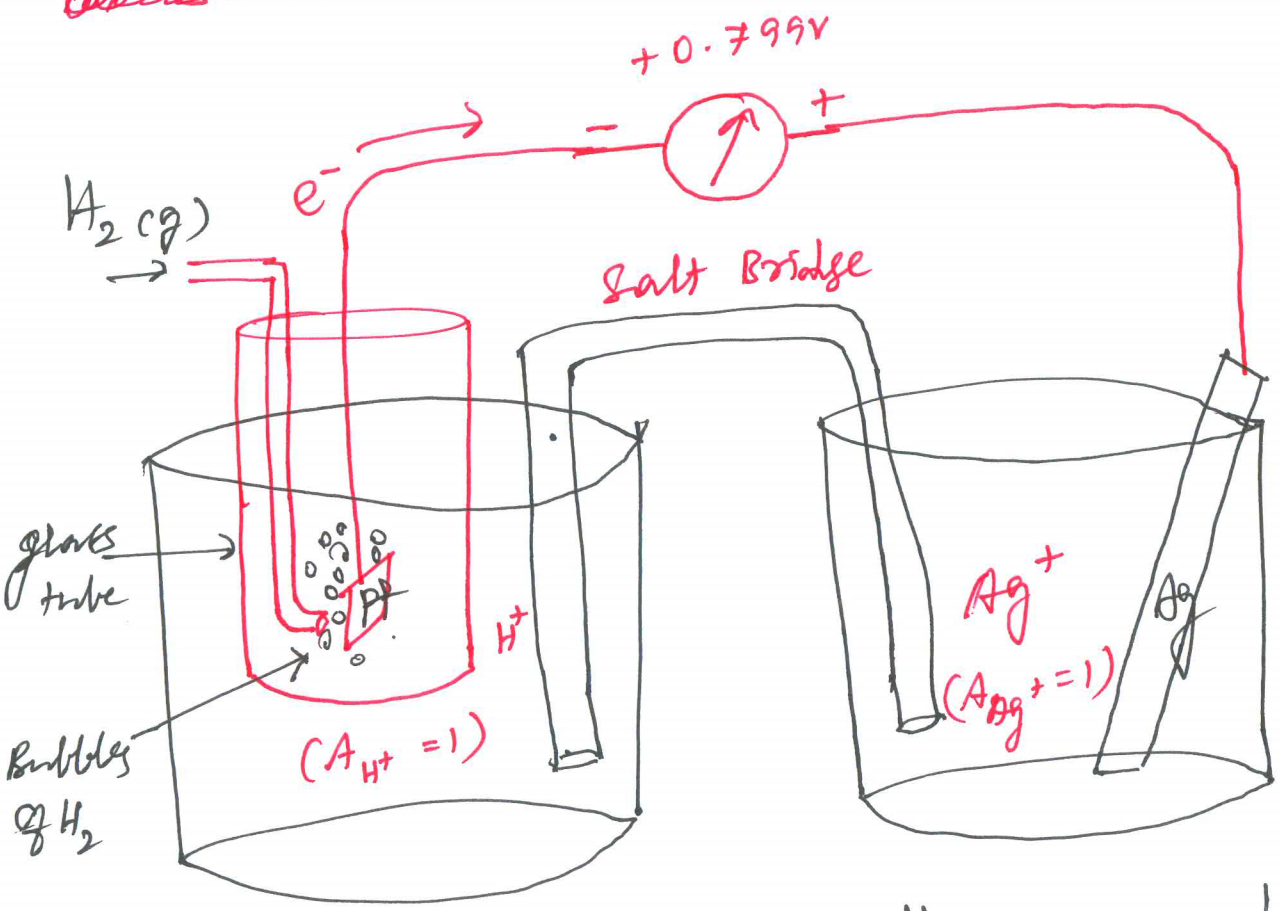
13-3

Standard potentials :-



$$Pt_{(s)} \mid H_2(g, A=1) \mid H^+(aq), A=1 \parallel Ag^+(aq, A=1) \mid Ag(s).$$

Standard Hydrogen Electrode (S.H.E)

(or)

$$S.H.E \parallel Ag^+(aq, A=1) \mid Ag(s)$$

The standard hydrogen half cell (or) Standard Hydrogen Electrode (SHE), is selected for coupling with the unknown half cell. It consists of a platinum electrode immersed in a 1M solution of H^+ ions maintained at 25°C. H_2 gas at one atmosphere enters the glass tube and bubbles over the platinum electrode. The hydrogen gas at the platinum electrode passes into solution, forming H^+ ions and electrons.

The emf of the SHE is zero volts. So, SHE can be used as a standard for other electrodes.

Standard emf of a cell :-

When the emf of a cell is determined under standard conditions, it is called the standard emf. It is defined as the emf of a cell with 1M solutions of reactants and products in solution measured at 25°C. It is represented by the symbol E°.

Standard Reduction potential :- (E^0)

If SHE (Standard Hydrogen Electrode) is placed on the left hand side of the half cell, the electrons flow from left to right and the given half cell electrode gains electrons. Then the observed emf of the combined electrochemical cell is then the emf of the half cell on the right hand. Such emf values of half cells, or half reactions are known as the standard reduction potential.

If the SHE be placed on the right hand side of the given half cell, the potential so obtained is called the standard oxidation potential.