



## DROPPING MERCURY ELECTRODE

Study of solutions or of electrode processes by means of electrolysis with two electrodes, one polarizable, the former formed by mercury regularly dropping from capillary tube.

POLARIZED ELECTRODE : Dropping Mercury Electrode (DME)

DEPOLARIZED ELECTRODE : Saturated Calomel Electrode

Mercury continuously drops from reservoir through a capillary tube into the solution

The optimum interval between drops for most analysis is between 2 and 5 seconds.

It consist of polarisable elctrode (DME) and non polarisable electrode ( saturated calomel electrode)

Between these electrodes, the required potential range (0 to -3v) can be applied

It consist of sample cell in which the sample solution to be analyzed this kept

Sample cell made up of glass and has tapering edge to hold at the bottom to hold mercury – after the droplets have been formed

■ The capillary is dipped into the solution

Supporting electrolyte is like kcl (50-100 times sample concentration) is added to the sample solution to eliminate migration current.

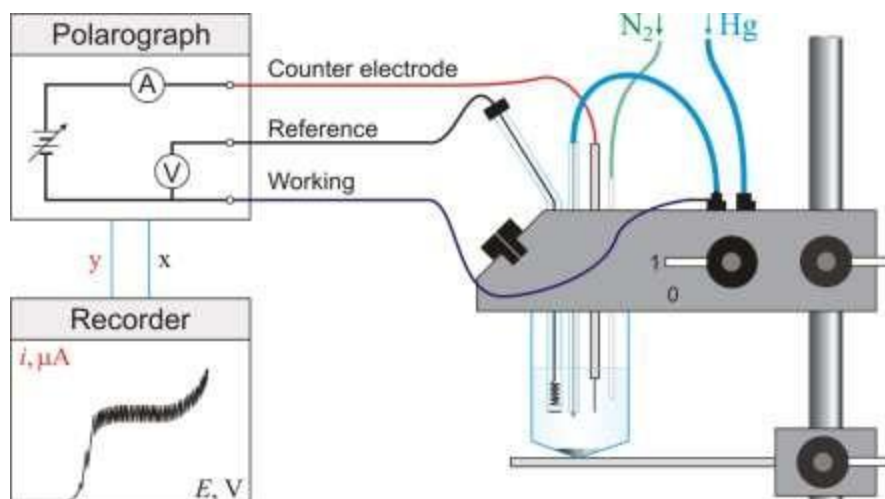
polarographic analysis “ diffusion which is proportional to the concentration of the electrolyte and hence only the diffusion current has to be measured

In normal condition, without the supporting electrolyte, migration current is also recorded which is not required

Oxygen present in sample solution is removed by passing nitrogen or using alkaline pyrogallol solution. Maximum suppressors are added in the required concentration.

When all these things are done, initial and final potential is set in the instrument the current voltage cure is recorded

From the current voltage curve , half wave potential & diffusion current is determined and thus qualitative and quantitative analysis is performed



### Advantages

- ✓ Surface area is reproducible
- ✓ Constant renewal of electrode surface eliminating poisoning effect
- ✓ Mercury forms amalgams with most metal ions and alkali metal ions which are reducible
- ✓ It is useful over the range of +0.4 to -1.8V

### Disadvantages

- ✓ Electrodes cannot be used above +0.4V
- ✓ Capillary is difficult to maintain since dust or other particulate matter can block the capillary
- ✓ Mercury can be easily oxidized thus limit the feasible range of the electrode