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CONSTRUCTION, WORKING OF DME AND RPE

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DME(Dropping mercury electrode)

It comes under polarisable micro-electrodes with a head of 40-60 μ m of mercury, from a resistance-glass capillary (0.05-0.08 mm in diameter and 5-9 cm long) in small, uniform drops. The dropping mercury electrode has the following advantages.

- (a) Its surface is reproducible, smooth, and continuously renewed; good reproducibility of the current potential curve and eliminates passivity or poisoning effects.**
- (b) The diffusion current assumes a steady value immediately after each change of applied potential, and is reproducible.**



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- (c) The large hydrogen over potential on mercury renders possible the deposition of substances difficult to reduce, e.g. the alkali metal ions, aluminium ion and manganese(II) ion. (The current-potential curves of these ions are inaccessible with a platinum micro-electrode.)**
- (d) The surface area can be calculated from the weight of the drops.**



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- **The dropping mercury electrode may be applied over the range +0.4 to about - 2.0 volts with reference to the S.C.E. Above +0.4 volt mercury dissolves and gives an anodic wave; it begins to oxidise to mercury(I) ion.**
- **At potentials more negative than about - 1.8 volts us S.C.E., visible hydrogen evolution occurs in acid solutions and the usual supporting electrolytes commence to discharge.**
- **The range may be extended to about - 2.6 volts us S.C.E. by using supporting electrolytes having higher reduction potentials than the alkali metals; tetra-alkyl ammonium hydroxides or their salts are satisfactory for this purpose.**



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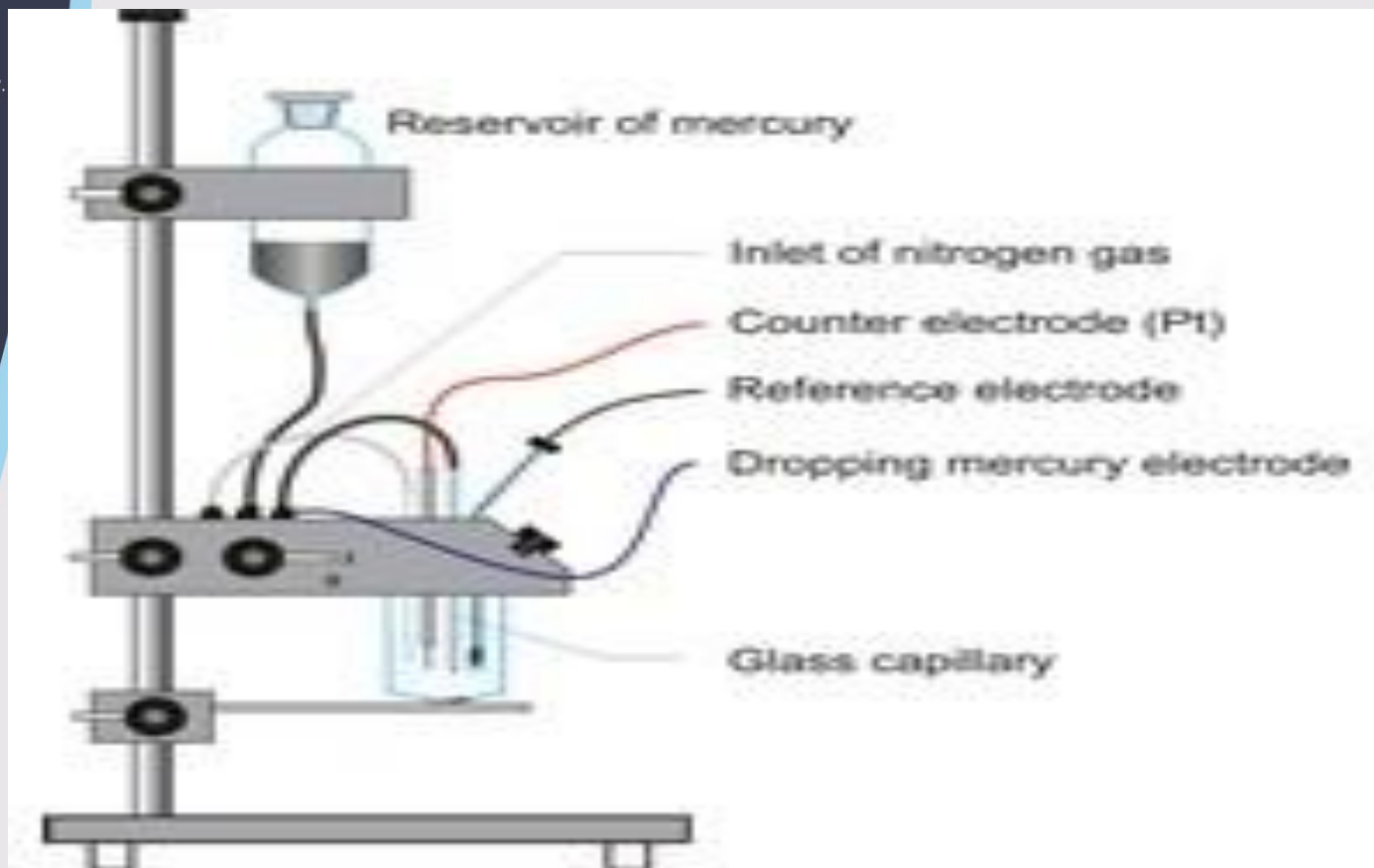


DIAGRAM OF DME



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RPE(ROTATING PLATINUM ELECTRODE)

- It consist of a glass rod with platium wire at about 600 rpm wire are made through mercury.
- So that potential can applied & current is measure

WHY platinum??

- Because mercury can not be used as electrode at positive potential of its oxidation
- rotating platinum is used.



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Why rotating ??

- Because with platinum as electrode , the attainment of steady state diffusion current is slow.
- One has to wait for a considerable time after each addition of the reagent. Therefore platinum electrode is rotated at 600 rpm.

Advantage of RPE

- It is simple construct. It increases the workable range on the positive voltage side up to 0.9v Thus it can be used at positive potential where as the mercury electrode may be used.
- The technique is more sensitive because the rotation of the electrode increase the value of diffusion current as much as time the value in polarography.



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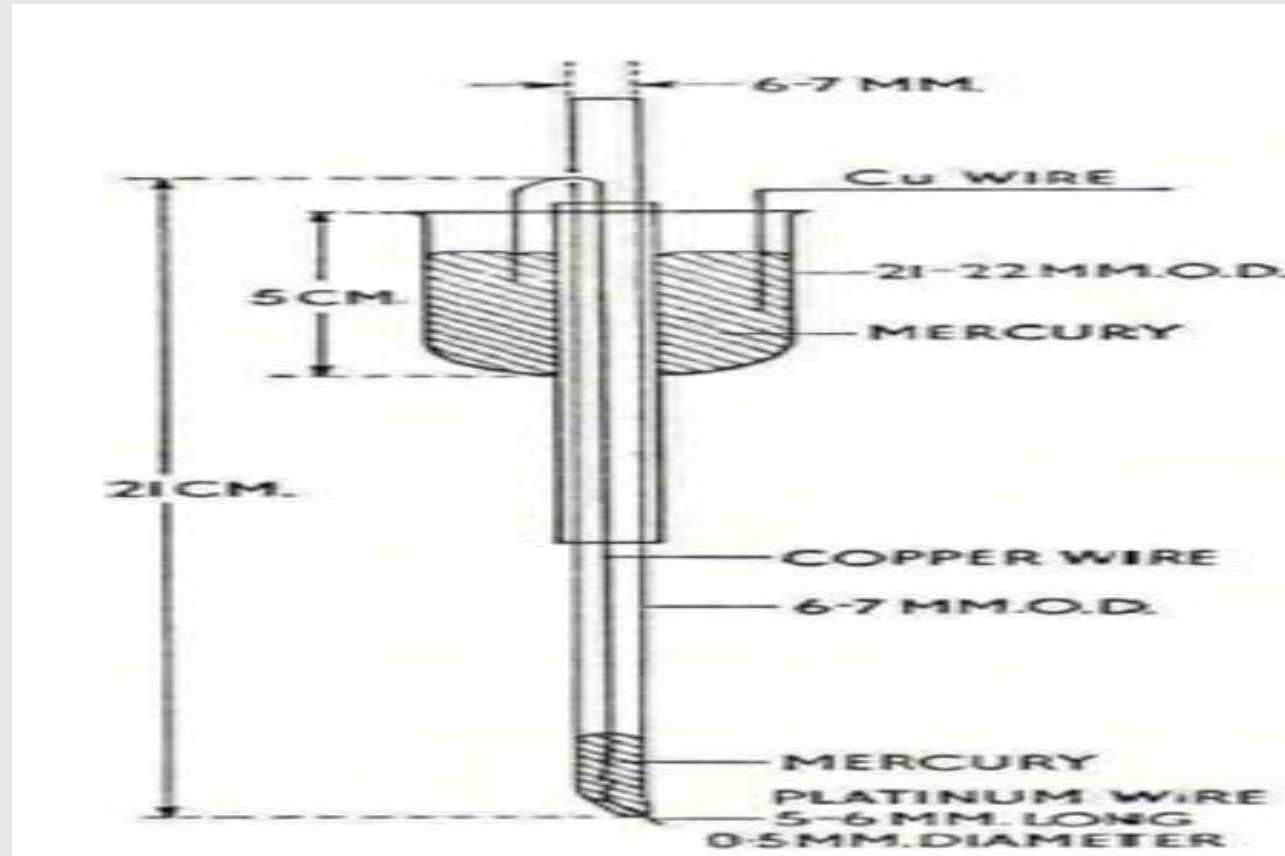


DIAGRAM OF RPE



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THANK YOU