Prepare 250 ml of a N/10 Solution Of Oxalic Acid From Crystalline Oxalic Acid

Theory

Crystalline oxalic acid is a primary standard, its standard solution can be prepared directly.

The formula for crystalline oxalic acid is $\begin{matrix}COOH\\|\\COOH\end{matrix} 2H_2O$. The ionic equation for the oxidation of oxalic acid is

$$\begin{matrix}COOH\\|\\COOH\end{matrix} \longrightarrow 2CO_2 + 2H^+ + 2e^-$$

It is clear from the above equation that two electrons are given out during oxidation of one molecule of oxalic acid.

$$\therefore \text{Eq. mass of oxalic acid} = \frac{\text{Molecular mass of oxalic acid}}{\text{No. of electrons lost by one molecule of it}}$$

$$= \frac{126}{2} = 63$$

$$\text{Strength } (g/l) = \text{Normality} \times \text{Eq. mass}$$

$$= \frac{1}{10} \times 63 = 6.3 \text{ g/l}$$

$\therefore$ For preparing 1 litre of $\frac{N}{10}$ oxalic acid solution 6.3 g of it have to be dissolved.

$\therefore$ For preparing 250 ml of $\frac{N}{10}$ oxalic acid, oxalic acid crystals required

$$= \frac{6.3}{1000} \times 250 = 1.575 \text{ g.}$$

Apparatus

Watch glass, analytical balance, weight box, fractional weight box, 250 ml beaker, glass rod, 250 ml measuring flask and wash bottle.

Chemical Required

Oxalic acid crystals and distilled water.

Procedure

1. Take a watch glass, wash it with distilled water and then dry it.
2. Weigh the clean and dried watch glass accurately and record its weight in the note book.

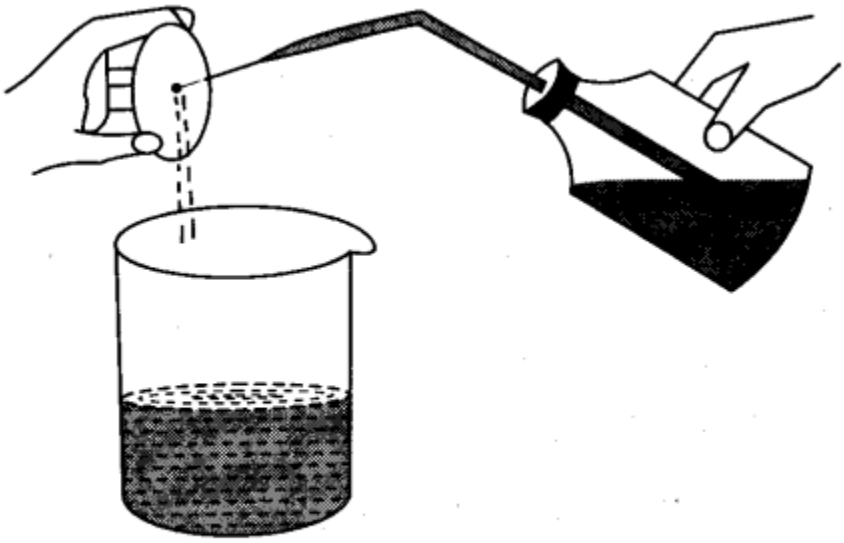

Fig. Washing of watch glass to transfer sticking particles to beaker.

3. Weigh 3.150 g oxalic acid on the watch glass accurately and record this weight in the note-book.
4. Transfer gently and carefully the oxalic acid from the watch glass into a clean 250 ml beaker. Wash the watch glass with distilled water with the help of a wash bottle to transfer the particles sticking to it into the beaker [Fig].
   The volume of distilled water for this purpose should not be more than 50 ml.
5. Dissolve oxalic acid crystals in the beaker by gentle stirring with a clean glass rod.
6. When the oxalic acid in the beaker is completely dissolved, transfer carefully the entire solution from the beaker into a 250 ml measuring flask (volumetric flask) with the help of a funnel [Fig].

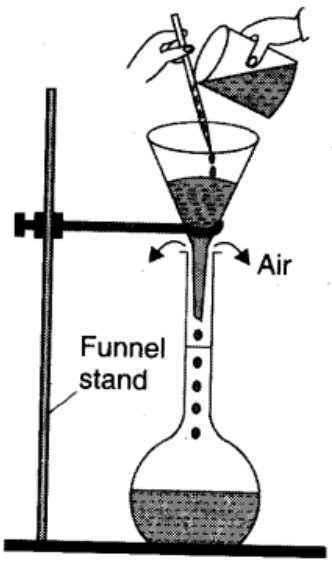

Fig. Transferring solution to measuring flask.

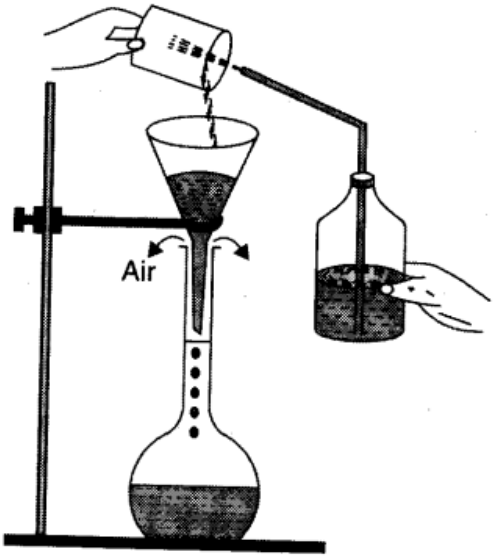

Fig. Transferring last traces of solution to measuring flask.

7. Wash the beaker with distilled water. Transfer the washings into the measuring flask [Fig].
8. Finally wash the funnel well with distilled water with the help of a wash bottle to transfer the solution sticking to the funnel into the measuring flask [Fig].
9. Add enough distilled water to the measuring flask carefully, up to just below the etched mark on it, with the help of a wash bottle.
10. Add the last few drops of distilled water with a pipette until the lower level of the meniscus just touches the mark on the measuring flask [Fig].

11. Stopper the measuring flask and shake gently to make the solution uniform through-out. Label it as oxalic acid solution.

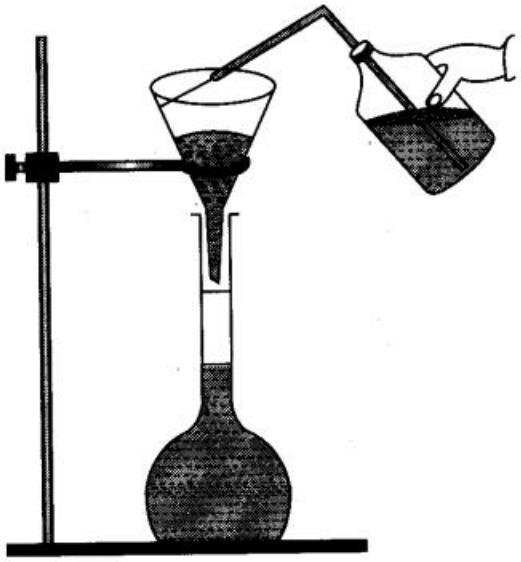

Fig. Washing last traces of solution from funnel to the measuring flask.

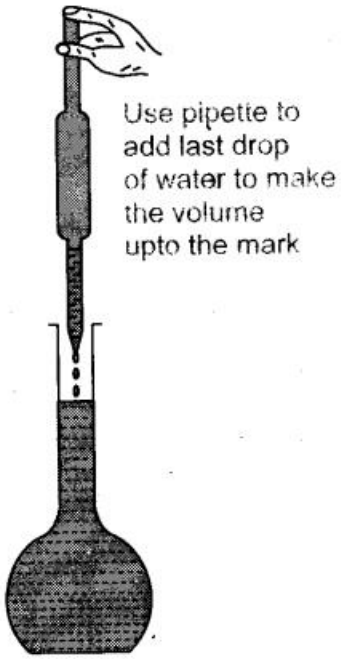

Fig. Using pipette to add last drop of water to make the volume upto the mark.