

Experiment No. (2)

Calculate the Equivalent Weight of Unknown Solid Acid

Titration is the process of ascertaining the exact volume of one solution that is chemically equivalent to a given amount of another substance either another solution or a given amount of solid material dissolved in a solvent. Buret is the apparatus that is usually used in titration, if a solution of an acid is titrated with a solution of a base. The equivalent point is the point at which chemical equivalent quantities mixed of an acid and base are mixed can be found by means of an indicator.

The Required Reagents:

- ◆ Solid acid (0.05gr).
- ◆ Phenolphthalein as indicator 2-3 drops.
- ◆ Sodium hydroxidNaOH (0.1N).
- ◆ Distilled water.
- ◆ Burette.
- ◆ Conical flask.

Procedure:

- 1) Weight (0.05 gr) of unknown solid acid and put it in the conical flask.
- 2) Dissolve this acid by adding (12.5 ml) of distilled water.
- 3) Put 2-3 drops of phenolphthalein as indicator and then titrate against the standard solution NaOH (0.1N) until the last drop of NaOH solution leaves a permanent pink color in the solution.
- 4) Record volume downward from the base at the end point.
- 5) Calculate the equivalent of acid and re-experiment to get two readings close.

Calculations:

$$\begin{array}{ccc} NV & = & NV \\ \text{For acid} & & \text{for base} \end{array}$$
$$N \times V = \left(\frac{\text{wt}}{\text{eq. wt}} \times \frac{1000}{V} \right) \times V$$

By division 1000

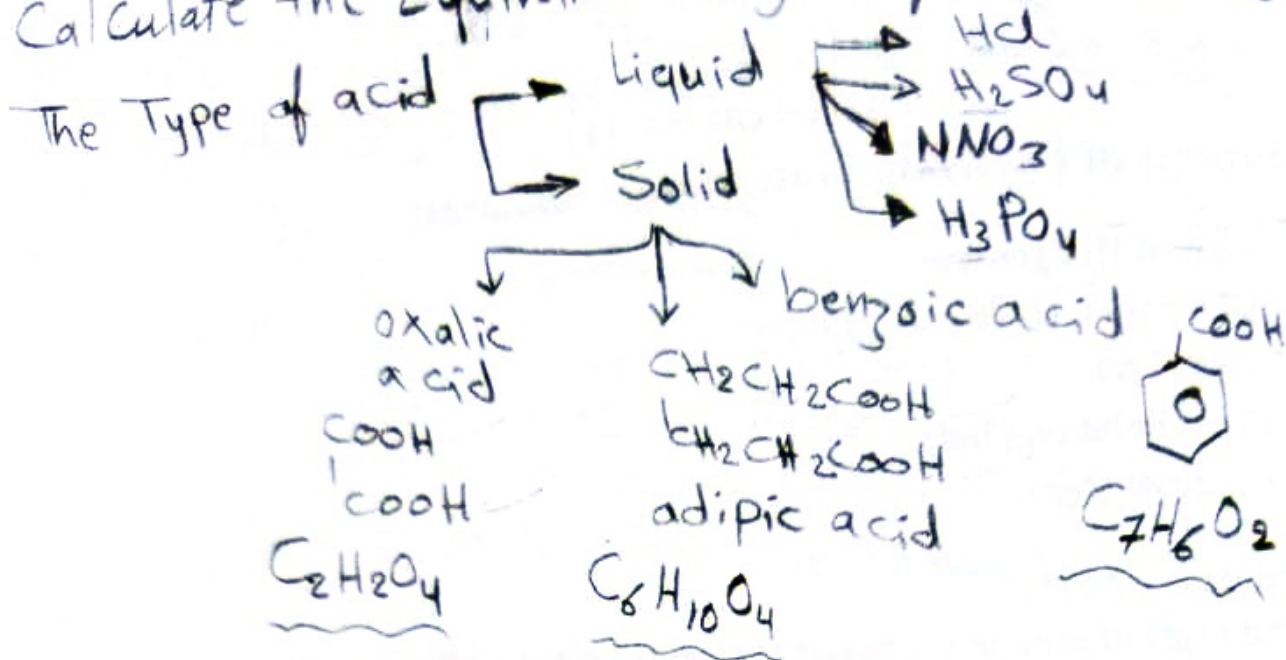
$$\frac{N \times V}{1000} = \frac{\text{wt}}{\text{eq. wt}}$$

Questions:

1. Define titration and give the tools of it.
2. Define the detector and give the nature of this work mechanism.

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* equivalent weight of acid = $\frac{\text{molecular weight}}{\text{The number of } H^+}$

الوزن الجزيئي = الوزن المكافئ
عدد ذرات H^+ المتفاعلة للحلول

* Titration = The fast & accurate process, the aim of this process is to find out the normal concentration of unknown acid by using standard base (NaOH).

The tools of this process is:

1. burette, 2. conical flask, 3. indicator, 4.

* indicator

مادة كيميائية معروفة التركيب تضاف إلى التفاعل لتغيير لونه
الماء والمخاطرة ولا تؤثر على التفاعل مباشرة ومن خلالها
يمكن معرفة نقطة انتهاء التفاعل بتغير لون المحلول
وعندها يسجل الحجم

اللون المتغير بين اللونين عديم اللون في الوسط الحمضي والوردي في الوسط القلوي