

جامعة الانبار

كلية : الصيدلة

قسم : الكيمياء الصيدلانية

اسم المادة باللغة العربية: الكيمياء التحليلية

اسم المادة باللغة الإنكليزية: Analytical Chemistry

المرحلة: الأولى

التدريسي: م.م. سحر فائق عبد صالح

عنوان المحاضرة باللغة العربية: الكيمياء التحليلية العملي التجربة الثانية

عنوان المحاضرة باللغة الإنكليزية: Practical Analytical Chemistry(2)

Exp. 2

Preparation and Standardization of HCl Acid

Hydrochloric acid is the most commonly used standard acid for volumetric analysis. Dilute solutions of the reagent are indefinitely stable and can be used in the presence of most cations without complicating precipitation reactions. It is reported that 0.1 N solutions can be boiled for as long as 1 hr without loss of acid.

Solutions of perchloric acid and sulfuric acid are also stable and can serve as standard reagents in titrations where the presence of chloride ion would cause precipitation difficulties. Standard solutions of nitric acid are seldom used because of their oxidizing properties.

A standard acid solution is ordinarily prepared by diluting an appropriate volume of the concentrated reagent and standardizing against a primary standard base. The composition of the concentrated acid is established through careful density measurements, following which a weighed quantity is diluted to an exact volume (tables relating density of reagents to composition are found in most chemistry or chemical engineering handbooks).

Procedure

To prepare 0.1N of an acid like hydrochloric acid (HCl), add about 8 ml of concentrated HCl to approximately 1 liter of distilled water. Mix thoroughly; store in a glass-stoppered bottle.

Sodium carbonate is a frequently used standard for acid solutions. Primary-standard grade sodium carbonate is available commercially.

Dry a quantity of primary-standard sodium carbonate for 2 hr at 110°C, and cool in a desiccator. Prepare 0.1N from sodium carbonate solution, and transfer by a pipette 10 ml in 250 ml conical flask, and introduce 2 drops of methyl orange indicator.

Fill a buret with the acid and titrate against the sodium carbonate until the solution just changes from orange to red. Write down the volume of the acid.

The equation of the reaction is:



no. of the acid milliequivalents = no. of the base milliequivalents

$$N_1 \times V_1 = N_2 \times V_2$$

$$N_1 \times (\text{from buret}) = 0.1 \times 10$$

N_1 = normality of acid

The strength of HCl solution g/L = $N_1 \times$ equivalent weight (molecular wt./1)