

وزارة التعليم العالي والبحث العلمي

كلية المستقبل الجامعة

قسم الصيدلة \_ المرحلة الاولى

مختبر الكيمياء التحليلية / الكورس الاول

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EX.1

## **Preparation and standardization of an acid**

### **Purpose of this experiment**

Preparation of approximately (0.1)N HCl

Determine the concentration of an unknown solution (HCl)

### **Chemicals and tools**

Dropper, balance, watch glass, HCl,  $Na_2CO_3$ , methyl red, distilled water, pipette, stand, clamp, brush, conical flask, spatula, funnel, volumetric flask, washing bottle, beaker.

### **Experimental work**

#### **1: preparation of (0.1)N HCl**

- Calculate the normality of the concentrated HCl:

$$N = \frac{Sp.g \times percentage \times 1000}{equivalent\ weight}$$

$$eq.wt(HCl) = \frac{M.wt}{no.of\ eq.}$$

$$eq.wt(HCl) = \frac{(35.5+1)}{1} = 36.5$$

$$N = \frac{1.19 \times (37/100) \times 1000}{36.5}$$

$$N = 12.0630$$

- To prepare (500)ml of (0.1)N HCl :

$$(N \times V)_{conc.HCl} = (N \times V)_{dil.HCl}$$

$$12.0630 \times V_1 = 500 \times 0.1$$

$$V_1 = 4.144\ mL$$

Then dissolved in water and transfer this solution to a (500) ml volumetric flask. Dilute to the mark with distilled water and mix thoroughly. Make label.

## 2- Preparation of (0.1)N sodium carbonate:

$$N = \frac{\text{Weight}}{\text{equivalent weight}} \times \frac{1000}{\text{volume (ml)}}$$

$$\text{eq. wt (Na}_2\text{CO}_3) = \frac{M.\text{wt}}{\text{total charge of positive ion}}$$

$$= \frac{(23 \times 2) + 12 + (16 \times 3)}{2} = \frac{106}{2} = 53$$

$$0.1 = \frac{wt}{53} \times \frac{1000}{250} \qquad wt = 1.325 \text{ g}$$

Then dissolved in water and transfer this solution to a (250)ml volumetric flask. Dilute to the mark with D.W and mix thoroughly . make a label.

## 3-Standardization of HCl solution with standard solution of Na<sub>2</sub>CO<sub>3</sub>

- 1- Washing the burette with distilled water and small amount of HCl (0.1)N.
- 2- Fill the burette with dilute HCl (0.1)N.

- 3- Take (5) ml of sodium carbonate by pipette and put it in a conical flask.
- 4- Add (2) drops of methyl red indicator to the conical flask.
- 5- Titrate with HCl until the color change from yellow to the red.
- 6- Repeat the titration 3 times and take the average.

Calculate the concentration of HCl solution in normality and molarity by using the law.

$$(N \times V)_{HCl} = (N \times V)_{Na_2CO_3}$$

$$(\text{average} = V1 + V2 + V3 / 3)$$

- 7- The equation of reaction :

