

*Ministry of Higher Education and Scientific Research*

*Mustansiriyah University*

*College of Science / Department of Chemistry*



# *Practical Analytical Chemistry*

*For First Year Students Biology Department*

*Nabih M. Abdulnabi*

2018

## *Preparation a standard solution of sodium carbonate ( $\text{Na}_2\text{CO}_3$ )*

### ❖ Purpose:

Prepare a 250 mL volume 0.1N standard sodium carbonate ( $\text{Na}_2\text{CO}_3$ ) solution.

### ❖ Theory: A standard solution can be prepared in either of two ways:

- A primary standard is carefully weighed, dissolved and diluted in accurately known volume. Its concentration can be calculated from this data.
- A solution is made to an approximate concentration secondary standards and then standardized by titrating with an accurately weighed quantity of a primary standard.

### Calculation

$$\text{M.wt}_{\text{Na}_2\text{CO}_3} = [(2 \times \text{Na} + 1 \times \text{C} + 3 \times \text{O})] = [(2 \times 23 + 1 \times 12 + 3 \times 16)] = 106 \text{ g/mol}$$

$$\text{Eq.wt}_{\text{Na}_2\text{CO}_3} = \frac{\text{M.wt}}{2 \times 1} = \frac{106}{2} = 53$$

$$N = \frac{w \text{ (g)}}{\text{eq.wt}} \times \frac{1000}{V, \text{ mL}} \quad \Rightarrow \quad 0.1 = \frac{w \text{ (g)}}{53} \times \frac{1000}{250 \text{ mL}}$$

$$w = 1.325 \text{ g of Na}_2\text{CO}_3$$

### *Equipment*

- Balance
- Beaker 250 mL
- Watch glass
- Glass rod (stirrer)
- Washing bottle
- Volumetric flask
- Funnel
- Dropper

### *Materials*

- Sodium carbonate ( $\text{Na}_2\text{CO}_3$ )
- Distilled water

## *Procedures*

1. Weigh accurately 1.325 g of anhydrous sodium carbonate ( $\text{Na}_2\text{CO}_3$ ) on a watch glass.
2. Transfer the sodium carbonate with 50.0 mL of distilled water in a clean 250 mL beaker volume, use a washing bottle with distilled water to wash the watch glass, and add the washing to the beaker.
3. Stirring the mixture with a glass rod until the sodium carbonate has fully dissolved.
4. Transfer the solution through a clean funnel into a 250 mL volumetric flask.
5. Wash the beaker, glass rod and funnel several times with distilled water using a washing bottle, and add the washings solution into the 250 mL volumetric flask.
6. Make up the volumetric flask volume within about 1 cm of the mark with distilled water, and then complete the volume by adding the water dropwise, using a dropping, stopper, shake the volumetric flask several times until obtaining a homogeneous solution.

volumetric  
flask

