Preparation and Standardization of 1 *N* NaOH Solution

- Sodium hydroxide is a strong base that is usually used to prepare standard alkaline solutions useful for volumetric analysis of acidic compounds.
- Sodium hydroxide is hygroscopic and can react with atmospheric carbon dioxide.

$$2NaOH + CO_2 \longrightarrow Na_2CO_3 + H_2O$$

contaminant
(water soluble)

Preparation and Standardization of 1 *N* NaOH Solution

- **preparation of 100 mL of 1 *N* NaOH solution**

Dissolve 4.5 g of sodium hydroxide in 100 mL distilled water, allow to cool, and then add saturated barium hydroxide solution drop wise with stirring until a precipitate is formed. Leave aside allowing for complete precipitation, filter, and collect the filtrate to be standardized against 1 *N* HCl solution.

Preparation and Standardization of 1 *N* NaOH Solution

$$2NaOH + CO_2 \longrightarrow Na_2CO_3 + H_2O$$

contaminant
(water soluble)

$$Ba(OH)_2 + Na_2CO_3 \longrightarrow BaCO_3 + 2NaOH$$

$BaCO_3$ ↓ water insoluble

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- **standardization**

$$NaOH + HCl \longrightarrow NaCl + H_2O$$

- 1 *N* HCl solution is used as a secondary standard

- phenolphthalein is used as the indicator

colourless $\longrightarrow$ ***pink***

***p*H: 8.3** **10**

Preparation and Standardization of 1 *N* NaOH Solution

❑ procedure

- wash the burette with the D. W. and the titrant (NaOH)
- fill the burette with NaOH to a level (adjust it)
- wash a 20 mL – bulb pipette with D. W. then by a little of HCl solution; fill it to the mark with the acid
- transfer the acid into a clean conical fask; add D.W. (50 mL)
- add 2 drops of phenolphthalein indicator
- start titration by adding NaOH solution drop wise with continuous stirring until the solution changes from colourless to pink
- record the volume of NaOH solution used and calculate the normality

Note ***wash the burette with water thoroughly***

Preparation and Standardization of 1 *N* NaOH Solution

- **procedure**

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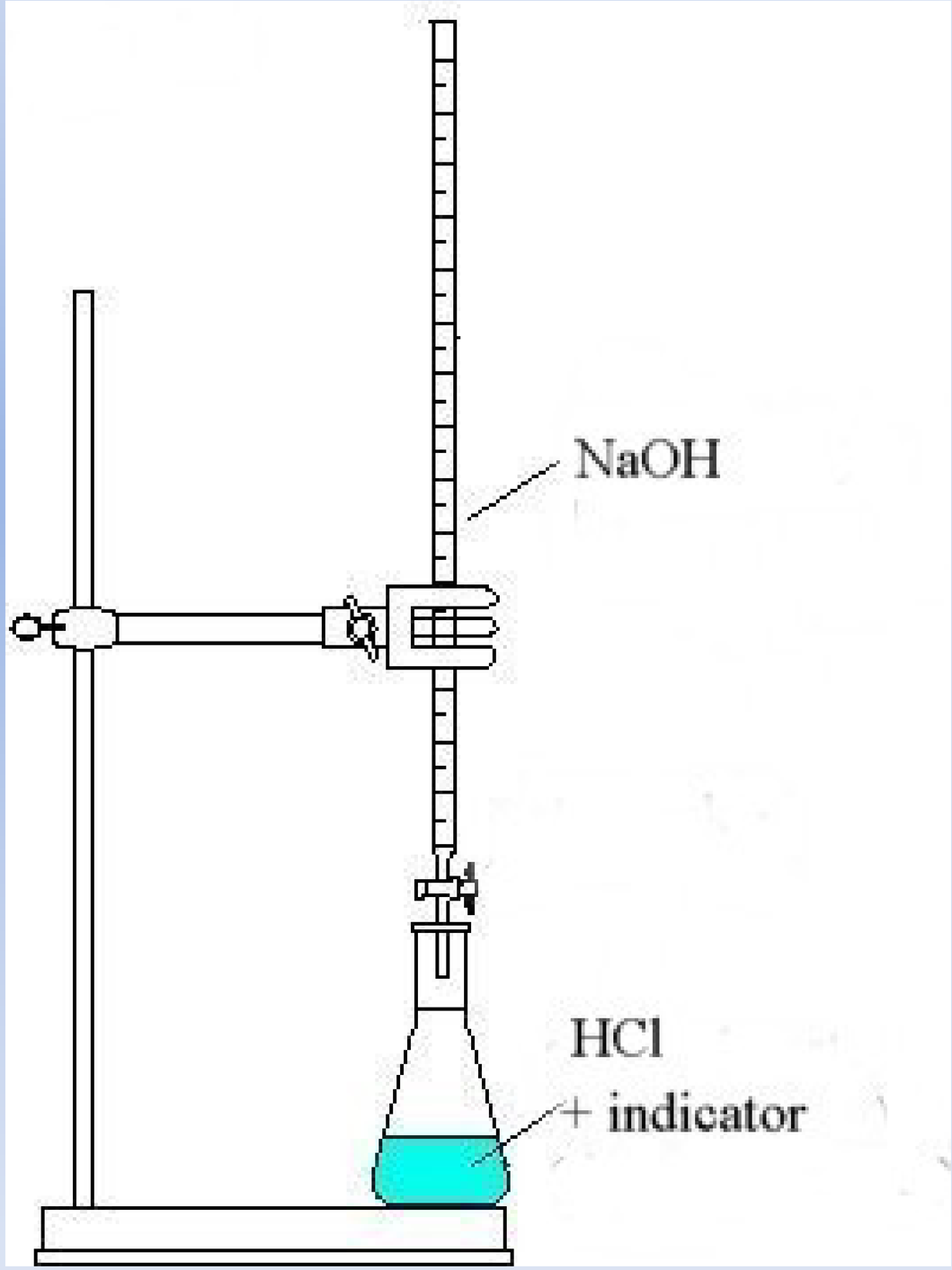
- **titration apparutus**



Preparation and Standardization of 1 *N* NaOH Solution

end point
(pink)

Preparation and Standardization of 1 *N* NaOH Solution

- **calculations**

$$\underbrace{N_1 \times V_1}_{\text{NaOH}} = \underbrace{N_2 \times V_2}_{\text{HCl}}$$

N_1 :the normality of NaOH solution
V_1 :the volume of NaOH solution used
N_2 :the normality of HCl
V_2 : volume of HCl solution used (20mL in our experiment)

Preparation and Standardization of 1 *N* NaOH Solution

- **Home work**

Why have you used 4.5 g of NaOH to prepare 100 mL of 1 *N* NaOH solution?