Al-Rasheed University College

Department of Medical Laboratory Technique

Medical Chemistry

Lab 4

by

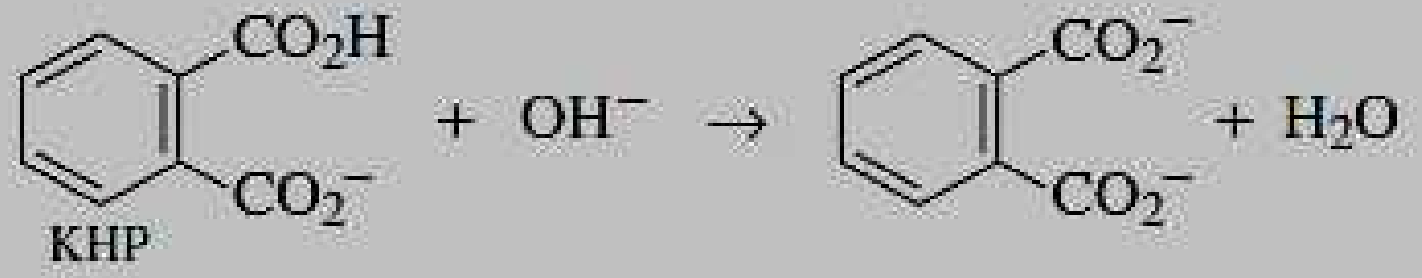
Dr. Kutaiba Ibrahim Alzand

EXPERIMENT 4 Standardization of Sodium Hydroxide against Potassium Hydrogen Phthalate

Principle

One-tenth molar sodium hydroxide is prepared and standardized against primary standard potassium hydrogen phthalate (KHP). A phenolphthalein end point is used.

Equations



$$HA^- + OH^- \rightarrow A^{2-} + H_2O$$

PROCEDURE

1. Dry a quantity of primary-standard potassium hydrogen phthalate (KHP) for about 2 hr at 110°C and cool in a desiccator.

2. Weigh 0.7-g sample into 250-mL conical flasks, and dissolve in 50 mL of distilled water.

3. Add 2 drops of phenolphthalein; titrate with base until the pink color of the indicator persists for 30 s.

4. Calculate the concentration of the NaOH solution.

The Standardization of Bases

- Several excellent primary standards are available for standardizing bases.
- Most are weak organic acids that require the use of an indicator with a basic transition range.

> Standard solutions of strong bases cannot be prepared directly by mass and must always be standardized against a primary-standard acid.

Potassium Hydrogen Phthalate

- Potassium hydrogen phthalate, $KHC_8H_4O_4$ is a nearly ideal primary standard. It is a nonhygroscopic crystalline solid with a relatively large molar mass (204.2 g/mol).
- For most purposes, the commercial analytical-grade salt can be used without further purification.