**Experiment:2**

**Determination of Bicarbonate in Blood**

**Introduction:**

-About 95% of the total carbon dioxide in human blood exists as bicarbonate (HCO3¯), 5% existing as dissolved CO2.

-The HCO3¯ concentration, for most clinical work, can be used as a diagnostic aid. ( N.R. of HCO3¯ in blood = 25 – 35 m eq / L)

**Principle:**

The HCO3¯ concentration is determined by adding an excess of 0.001M HCL, to volatilize the HCO3 as CO2, swirling to allow the CO2 to escape and then back-titrating the excess HCL with 0.001M NaOH

HCO3¯ + HCL H2O + CO2 + CL¯

Excess HCL + NaOH NaCL + H2O ( back titration)

**Back Titration:**

It's one type of titration, called back titration because it's not carried out with the solution whose concentration is required to be known as in the case of normal titration, but with the excess volume of reactant which has been left over after completing reaction with the required solution.

**Reagent:**

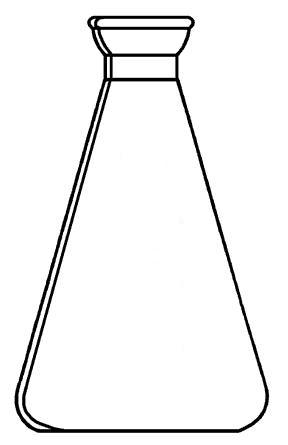
1- 0.1% phenol red in 0.003 M NaOH.

2- 0.001 M NaOH and 0.001 M HCL, should be FRESHLY prepared.

3- 1% saline (NaCL).

**Procedure:**

**I) Comparison Solution**

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1- 6 ml 1% saline

2- 0.2 ml sample (NaHCO3)

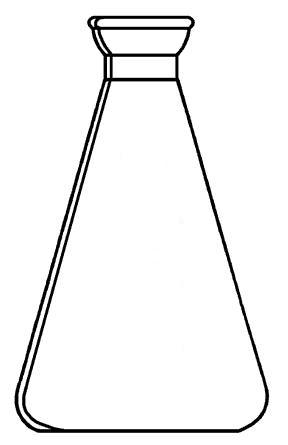
3- 2 drops phenol red

***Erlenmeyer flask***

(Shake after each addition)

4- Titrate with NaOH (0.001 M) until get pink color (end point).

**II) Titration of the Sample**

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1- 0.2 ml sample (NaHCO3)

2- 10 ml HCL (0.001 M)

3- 4 ml saline

4- 2 drops phenol red

***Erlenmeyer flask***

(shake after each addition)

5- Titrate with NaOH (0.001 M) until get pink color.

**Calculation:**

- Total m moles of HCL = M X V

T = 0.001 X 10 = 0.01 m moles

- Un reacted m moles of HCL = M X V

U = 0.001 X 6.2 ( volume of NaOH )

= 0.0062 m moles

-Reacted m moles of HCL (m moles of HCO3¯) = T – U

= 0.01 – 0.0062

= 0.0038 m moles / 0.2 ml

m mole in ONE ml = ( 0.0038 / 0.2 ) x 1

= 0.019 m mole / ml

~ 0.02 M

m mole in ONE liter = 0.019 x 1000

= 19 m mole / L

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