

# Chemistry Lab Report

**Exp No:** 02

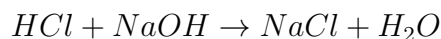
**Exp Name:** Determination of the strength of supplied  $NaOH$  solution by using standard  $HCl$  solution.

**Equipments:** 1. Burette(500mL) 2. Conical flask(250mL) 3. Funnel 4. Wash bottle 5. Pipette 6. Burette stand.

**Theory:** Titration is a common laboratory method of quantitative chemical analysis to determine the concentration of an identified analyte (a substance to be analyzed). A reagent, termed the titrant or titrator, is prepared as a standard solution of known concentration and volume. The titrant reacts with a solution of analyte to determine the analyte's concentration. The volume of titrant that reacted with the analyte is termed the titration volume.

**Chemicals:** 1.  $HCl$  2.  $NaOH$  3. Distilled water 4. Indicator(Phenolphthalein).

**Chemical Reaction:**



Now,

$$e_1 S_1 V_1 = e_2 S_2 V_2 \Rightarrow S_2 = \frac{e_1 S_1 V_1}{e_2 V_2} \dots \dots \dots (1)$$

Where,  $e_1 = 1$ ,  $e_2 = 1$

$S_1$  = concentration of  $HCl$

$S_2$  = concentration of  $NaOH$

$V_1$  = volume of  $HCl$

$V_2$  = volume of  $NaOH$

**Description:**

- 01.** 0.1(M) $HCl$  solution preparation: We are provided 250mL of  $NaOH$  by our lab assistant and it's ready for experimental work.
- 02.** Standardization of  $NaOH$  solution: At first fill the burette with  $NaOH$  solution and record the initial burette reading. Then take 10mL  $HCl$  in conical flask and mix it up with 1/2 drops of Phenolphthalein.
- 03.** Determination: Mix  $NaOH$  with  $HCl$  drop by drop carefully until  $HCl$  solution changes its color. When  $HCl$  changes its color that means it's the end point of our titration. Now mark the reading for  $NaOH$  from burette for our further calculation.

**Data Table:**

Burette $NaOH$ volume				
$SN$	$V_{1HCl}$	$Initial_{(mL)}$	$Final_{(mL)}$	$Diff_{initial-final}$
01	$10mL$	$0mL$	$10.4mL$	$10.4mL$
02	$10mL$	$10.4mL$	$21.6mL$	$10.9mL$
03	$10mL$	$21.6mL$	$32.2mL$	$10.6mL$

**Calculation:**

From the table, Mean value of  $NaOH = \frac{10.4+10.9+10.6}{3} = 10.75mL$

From equation (1) we get,  $S_2 = \frac{e_1 S_1 V_1}{e_2 V_2} = \frac{0.1 \times 10.75}{10} = 0.1075 \text{ M}$

**Result:** The concentration of  $NaOH$  is **0.1075 M**.

**Discussion:** The molarity of  $NaOH$  may not be totally correct for some certain chemical fault.

**Precaution:**

- 01.** Usually an air bubble is present in the nozzle of the burette. It must be removed before taking the initial reading.
- 02.** There should not be any kind of leakage from the burette during titration.
- 03.** Always add acid to water.
- 04.** Don't let base level in burette to reach zero.