Chemistry Lab Report

Exp No: *02*
Exp Name: Determination of the strenght of supplied $NaOH$ solution by using standard HCl solutoin.
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:

$$HCl + NaOH \rightarrow NaCl + H_2O$$

Now,

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

Where, $e_1 = 1, \quad e_2 = 1$

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 fil 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 it's color. When HCl changes it's 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, $S_2 = \frac{e_1 S_1 V_1}{e_2 V_2} = \frac{0.1 \times 10.75}{10} = 0.1075$ M

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

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

Precaution:
01. Usually an air bubble is present in the nozzele of the burette. It must be removed before taking the inital readint.
02. There should not be any kind of leakage from the burette during titration.
03. Always add acid to water.
04. Dont't let base level in burrete to reach zero.