

Fifth lab

An analysis of a mixture of Na_2CO_3 and NaOH using two indicators and a standard HCl solution

Theory:

1- When a known volume of the mixture is titrated with HCl in presence of ph. ph., the acid reacts with all the sodium hydroxide and with only half of the carbonate.

$$V_1 = \text{all hydroxide} + 1/2 \text{ the carbonate}$$

2- When a known volume of the mixture is titrated with HCl in presence of M.O., the acid reacts with all the hydroxide and all the carbonate.

$$V_2 = \text{all hydroxide} + \text{all carbonate}$$

$$\text{Volume of HCl} = 1/2 \text{ carbonate} = V_2 - V_1 = V \text{ ml}$$

$$\text{Volume of HCl} = \text{all carbonate} = 2V \text{ ml}$$

$$\text{Volume of HCl} = \text{NaOH} = V_2 - 2V \text{ ml}$$

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Procedure 2:

1- Transfer with a pipette 10 ml of the mixture to a conical flask, and add one or two drops of ph. ph.

2- Add the acid from the burette till the solution becomes colorless.

- The volume of acid in the case is V_1 and is equivalent to all the hydroxide and half the carbonate.

3- Then add two drops of methyl orange to the same conical flask and continue titration to the faint red color or the orange color.

- The volume of acid in the case is V_2 and is equivalent to the second half of carbonate.

3- Repeat the experiment three times and tabulate your results.

4- Calculate the strength of the sodium hydroxide and the sodium carbonate in the mixture.

Calculations2:

- **In the case of Na_2CO_3 :**

$$N_1 \times 2V_2 = N (\text{Na}_2\text{CO}_3) \times 10$$

$$\text{Strength } \text{Na}_2\text{CO}_3 = N (\text{Na}_2\text{CO}_3) \times 53 \quad \text{g/L}$$

- **In the case of NaOH :**

$$N_1 \times (V_1 - V_2) = N (\text{NaOH}) \times 10$$

$$\text{Strength } \text{NaOH} = N (\text{NaOH}) \times 40 \quad \text{g/L}$$

Lab report

- ***Name:***
- ***Group:***
- ***Date:***
- ***Title of experiment:***

- ***Material:***

Indicator:

- Results and calculation:

Nb.	Volume of unknown mixture N(ml)	Burette readings			Volume of Known HCl (ml)
		V =reading1	V=reading2	V=reading3	

- *Calculations:*

- *Dissociation:*