

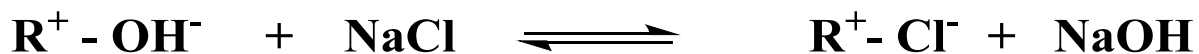
## Experiment (5)

### Calibration of hydrochloric acid using ion exchanger

#### The theoretical part

The anion exchanger contains the hydroxyl groups which have negative charge where ion exchange occurs between (OH<sup>-</sup>) group and ions that have negative charge found in the solution (mobile phase)

When a sodium chloride or potassium chloride solution is added to an anion exchanger, the exchange between chloride ions and hydroxyl ions will be as follows:



The solution that flow from the column is NaOH and by the calibration of the base (NaOH) with the hydrochloric acid (HCl) we can know the concentration of the used acid.

#### Materials

- 1 - AgNO<sub>3</sub> Silver Nitrate (0.1 m).
- 2- NaCl Sodium Chloride.
- 3- Phenol Naphthalene indicator.
- 4- NaOH Sodium Hydroxide (3M).
- 5 - HCl Hydrochloric acid.

## Procedure

1. Reactivation the ion exchanger column by using the NaOH (3M).
- 2 - Wash the column several times with distilled water and then check it by silver nitrate detector, and continue to wash the column until it becomes neutral.
- 3- Carefully weigh (0.1g) from the sample (NaCl).
- 4- Dissolve the salt in a small amount of distilled water and then transfer to the ion exchange column.
- 5- Collect the solution from the bottom of the column into a conical flask.
- 6- Collect the first batch of the water from the column and check it by adding a drop of the phenol naphthaline indicator. when the appearance of pink - purple, add another batch of distilled water to the column and also check it by use the indicator and repeat this process until the disappearance of pink - violet.
- 7- Transfer The collected solution to the conical flask and calibrate it with the hydrochloric acid in the burette.

## Calculation

- 1- No. of Meq.of OH<sup>-</sup> = No. of Meq.of NaCl = No. of Meq.of HCl
- 2- Calculate PH?

## Discussion Questions

- 1 - How do you know the resin is cationic or anionic?
- 2- Why we calibrate the elution solution collected from anionic column with hydrochloric acid?