Experiment no.1

Name of Experiment: Refining Crude Table salt (NaCl)

Theory:

Crude table salt contain impurities that make the salt hygroscopic and sometimes bitter, and these impurities include Ca^{2+}, Mg^{2+} ion and SO_4^{2-}.

This experiment describe necessary steps to get pure table salt.

Procedure:

1-Dissolve 0.8g crude table salt in 15mL distilled water in beaker, add drops of $BaCl_2$ solution (2%), notice precipitate formation then add other drops.

2-Filter the precipitate and collect filtrate in small beaker then add 2drop(2%)$BaCl_2$ if the precipitate formed again then filter again, repeat this step till the ppt. is no longer formed when $BaCl_2$ solution added.

3-Add(5% Na_2CO_3 solution), notice ppt. formation , then filter the solution , add to filtrate other drops Na_2CO_3 solution, continue this step till the ppt. is no longer formed when Na_2CO_3 solution added to the filtrate.

4-Add to the filtrate drops of diluted HCl solution (0.2M)till the solution neutralized using pH paper as indicator.

5-Evaporate the solution in beaker weighed before on heater till pure crystals appear from table salt.

6-Weigh product then find the percentage of impurities.

$Ba^{2+} + SO_4^{2-} \rightarrow BaSO_4 \downarrow$

$CO_3^{2-} + Ca^{2+} \rightarrow CaCO_3 \downarrow$

$CO_3^{2-} + Mg^{2+} \rightarrow MgCO_3 \downarrow$

$Na_2CO_3 + 2HCl \rightarrow 2NaCl + CO_2 \uparrow + H_2O$

Calculations:

$$\text{Pure salt\%} = \frac{weight\ of\ pure\ salt}{weight\ of\ sample} * 100 = X$$

Impurity % = $100 - X$