Experiment No. (1) Purification of Salt

- The aim of this experiment is to get pure salt which is formed from Sodium Chloride NaCl by purifying crude salt which contains impurities like Magnesium Sulfate $MgSO_4$ and Calcium Sulfate $CaSO_4$.

Instruments:

1. Beaker
2. Funnel
3. Dropper

Procedure:

1. Dissolve (5gm) of salt in (25ml) of distilled water, and then do filtration if necessary.
2. Add Barium Chloride $BaCl_2$ to the solution drop by drop to precipitate Barium Sulfate $BaSO_4$. Then the solution is filtered and two drops of Barium Chloride $BaCl_2$ are added to ensure completion of precipitation.

$$MgSO_4 + BaCl_2 \rightarrow BaSO_4 + MgCl_2$$

$$BaCl_2 + CaSO_4 \rightarrow BaSO_4 + CaCl_2$$

3. Add Sodium Carbonate Na_2CO_3 gradually to precipitate Magnesium and Barium and calcium.

$$\begin{matrix} MgCl_2 & & MgCO_3 \\ CaCl_2 + Na_2CO_3 & \rightarrow & CaCO_3 + 2\,NaCL \\ BaCl_2 & & BaCO_3 \end{matrix}$$

4. Add diluted Hydrochloric acid to the pervious precipitant, until the solution is balanced and pure salt is formed according to the fallowing equation.

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

5. Place the solution that resulted from pervious step in clay dish , heat it until the water evaporate and salt forms, filter the salt crystals wash them with water and dry them in oven. Now you have pure salt.
6. Calculation: measure the weight of crude and pure salt.