Experiment (4)

Analysis of a mixture (sodium bicarbonate + sodium carbonate)

1. Repeat the same steps in experiment No.3.
2. Volume of HCl required to reach the end point of first titration using phenolphthalein indicator is "**X**" ml.
3. Volume of HCl required reaching the end point of second titration using Methyl Orange indicator is "**Y**" ml.

Calculations:

$$X = Volume\ of\ HCl\ equivalent\ to\ \frac{1}{2}\ CO_3^=$$

$$Y = Volume\ of\ HCl\ equivalent\ to\ \frac{1}{2}\ CO_3^= + HCO_3^-$$

$$(X - Y) = Z \rightarrow Volume\ of\ HCl\ equivalent\ to\ HCO_3^-$$

$$2 * X \rightarrow Volume\ of\ HCl\ equivalent\ to\ CO_3^=$$

$$N_{acid} * V_{acid} = N_{base} * V_{base}$$

$$N_{acid} * Z\ \ = N_{OH^-} * 10 \cdots ①$$

$$N_{acid} * 2X\ \ = N_{CO_3^=} * 10 \cdots ②$$

$$concentration\ of\ [HCO_3^-]_{(ppm)} = N_{HCO_3^-} * eq.wt * 1000$$

$$concentration\ of\ [CO_3^=]_{(ppm)} = N_{CO_3^=} * eq.wt * 1000$$