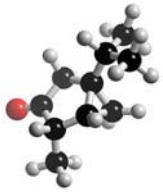
AS 1.2/C

FINDING THE M_r OF $MHCO_3$



Aim

You are supplied with a base, $MHCO_3$. Your task is to use the standardised hydrochloric acid from experiment 1.01 to find the M_r of $MHCO_3$ and so the identity of M.

$$HCl(aq) + MHCO_3(aq) \rightarrow MCl(aq) + CO_2(g) + H_2O(l)$$

Safety

hydrochloric acid
metal hydrogencarbonate

Method

1) Weigh out accurately about 2.5 g of $MHCO_3$ and make it up to 250 cm^3 of solution in a volumetric flask. Record masses in a suitable table below.

2) Titrate 25 cm^3 portions of this solution against the hydrochloric acid until concordant results are achieved. Use screened methyl orange as indicator. Tabulate your results clearly.

Analysis

3) Use your results to find the M_r of $MHCO_3$.

……

……

……

……

……

4) Calculate the A_r of M. ……

5) Identify M. ……

6) Calculate the maximum percentage apparatus error in the final result. Standard errors in apparatus are as follows:

balance	± 0.001 g
volumetric flask	± 0.1 cm^3
25 cm^3 pipette	± 0.1 cm^3
burette (start & end readings and end point)	± 0.15 cm^3

……..

……..

……..

……..

……..

Evaluation

7) Comment on the reliability of your titration results and so your titration technique.

……..

……..

8) The compound is actually potassium hydrogencarbonate. Calculate the M_r of this compound using A_r values from the Periodic Table.

……..

9) Find the difference between your value of the M_r and the actual M_r as a percentage of the actual value.

……..

……..

10) Comment on the accuracy of your results. ……..

……..

……..

11) If you had not dipped the pipette under the surface of the solution when draining the pipette in each titration, explain how it would have affected your final value of the M_r of the $MHCO_3$.

……..

……..

……..

12) If you had not overfilled the volumetric flask when preparing the stock solution, explain how it would have affected your final value of the M_r of the $MHCO_3$.

……..

……..

……..

13) Explain why using a balance of precision ±0.1 g would not be suitable in this experiment.

……..

……..

……..