

Revision Gravimetric Analysis

Name:

- 1) The percentage, by mass, of NaCl, in a sample of baby food is determined by a gravimetric procedure.

Some of the steps are outlined below in no particular order.

- i) Place the steps in their correct order as you would if conducting the gravimetric procedure.
 - a) Wash the precipitate with distilled water.
 - b) Weigh filter paper
 - c) Weigh the sample of baby food
 - d) Dissolve sample of baby food in distilled water
 - e) Filter and wash the insoluble residue left in the filter paper with distilled water.
 - f) Collect the filtrate and add excess AgNO_3 .
 - g) Dry and weigh the precipitate and filter paper.
 - h) Filter the precipitate.

There are two steps in which washing with distilled water is specified.

- ii) What is the impact on the final result if the first washing is not done? Explain

- iii) What is the impact on the final result if the second washing is not done? Explain

- iv) Write an ionic equation for the formation of the precipitate.

- v) A 5.502g sample of one particular brand of baby food was analysed for its salt content by precipitation of chloride ions as AgCl(s) . If 0.270g of AgCl(s) find the percentage by mass of NaCl in the baby food.

2) Phosphorus is added to fertilisers in the form of P_2O_5 (molar mass 142.0 g mol⁻¹). A 2.563 g sample of fertiliser is mixed with 40.0 mL of distilled water and the insoluble residue removed using vacuum filtration. 50.0 mL of 10% $MgSO_4 \cdot 7H_2O$ solution was added to the filtrate followed by 150.0 mL of 2 M NH_3 solution. A white precipitate forms which is later filtered and washed with 10 mL of distilled water.

The precipitate is dried to constant mass and weighed. A final mass of 3.941 g of precipitate was obtained. The known formula of the precipitate is $MgNH_4PO_4 \cdot 6H_2O$ (molar mass = 245.3 g mol⁻¹)

a) Calculate the percentage by mass of P_2O_5 in the fertiliser.

b) When $MgNH_4PO_4 \cdot 6H_2O$ is heated above the boiling point of water it converts completely into $MgNH_4PO_4$. Would the calculated result, in a) above, be higher, lower or the same if the precipitate had been **deliberately** heated in a boiling solution for several minutes before drying and weighing? Explain your answer.