

AQA – Energetics – AS Chemistry P1

1. No.8

0 8

This question is about silver nitrate.

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. 1

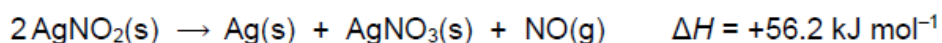
Define standard enthalpy of formation.

[2 marks]

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. 2

Silver nitrate(V) is formed when silver nitrate(III) undergoes thermal decomposition.

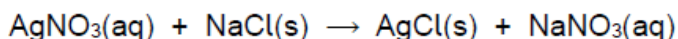
The standard enthalpy of formation of $\text{AgNO}_3(\text{s})$ is $-123.0 \text{ kJ mol}^{-1}$ The standard enthalpy of formation of $\text{NO}(\text{g})$ is $+90.4 \text{ kJ mol}^{-1}$ Determine the standard enthalpy of formation of $\text{AgNO}_2(\text{s})$ **[2 marks]**Standard enthalpy of formation _____ kJ mol^{-1}

0 8 . 3

Suggest why the enthalpy change for the thermal decomposition of solid silver nitrate(III) is difficult to determine experimentally.

[1 mark]

Silver nitrate(V) solution reacts with solid sodium chloride.



A student does an experiment to determine the enthalpy change for this reaction.

The student follows this method:

1. Measure out 50 cm³ of 0.10 mol dm⁻³ aqueous silver nitrate(V) using a clean, dry measuring cylinder.
2. Pour the silver nitrate(V) solution into a glass beaker.
3. Weigh out 2.00 g of solid sodium chloride (an excess) using a weighing boat and tip the solid into the silver nitrate(V) solution. Reweigh the weighing boat to determine the mass of sodium chloride added.
4. Add a lid to the beaker that has two small holes for a stirring rod and for a thermometer.
5. Stir the mixture with a plastic stirring rod whilst recording the temperature with a thermometer.
6. Record the maximum temperature reached.

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Identify **three** aspects of this method which could cause inaccurate results.

Describe how the student could improve these three aspects of the method to obtain more accurate results.

[6 marks]

Inaccuracy 1 _____

Improvement 1 _____

Inaccuracy 2 _____

Improvement 2 _____

Inaccuracy 3 _____

Improvement 3 _____