

AQA – Amount of substance – A2 2023 Chemistry P2

1. No.7

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A gas syringe that does not have any graduations is calibrated using a known mass of propanone (boiling point = 56.2 °C).

The sealed gas syringe contains 0.146 g of propanone ($M_r = 58.0$) at a temperature of 95 °C and a pressure of 103 kPa

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Calculate the volume, in cm³, of propanone in the gas syringe.

The gas constant, $R = 8.31 \text{ J K}^{-1} \text{ mol}^{-1}$

[4 marks]

Volume of propanone _____ cm³

07.2 The gas syringe is then cooled to 75°C , without changing the pressure.

Calculate the decrease in volume.

(If you were unable to calculate the volume in Question 07.1, you should use the volume 89 cm^3 . This is not the correct answer.)

[2 marks]

Decrease in volume _____ cm^3

07.3

The total uncertainty in using the balance to measure the mass of propanone in Question 07.1 is ± 0.001 g

Calculate the uncertainty that this causes in the volume, in cm^3 , of propanone calculated in Question 07.1.

(If you were unable to calculate the volume in Question 07.1, you should use the volume 89 cm^3 . This is not the correct answer.)

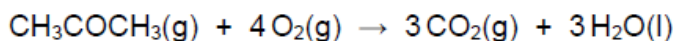
[2 marks]

Uncertainty _____ cm^3

07.4

A 600 cm^3 sample of propanone is mixed with 2800 cm^3 of oxygen in a container at 60°C and 100 kPa . The mixture is ignited.

When the reaction is complete, the remaining mixture of gases is cooled to 60°C at 100 kPa



Calculate the total volume of the remaining gas mixture.

[2 marks]

Volume _____ cm^3