

### Exercise 1.63 – Experimental errors and inaccuracies

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**Q163-01** In a titration experiment which of the following pieces of apparatus may contain residual water without affecting the results of the titration.

- I burette
- II conical flask
- III pipette

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**Q163-02** In an experiment 3.60 g of a standard acid was weighed out on an electronic balance. If the balance registers to two decimal places what is the percentage error in the mass?

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**Q163-03** Why is it important to weigh out larger rather than smaller amounts on an electronic balance?

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**Q163-04** If 5.40 g of a solid is weighed out on a 2 decimal place electronic balance and dissolved in a 250 cm<sup>3</sup> volumetric flask with a tolerance of  $\pm 0.23$  cm<sup>3</sup>, what is the percentage error in the solution concentration.

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**Q163-05** If the solute in question 4 has a relative molecular mass of 204.23, calculate the absolute error in the molarity of the solution.

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**Questions 6- 10 use the following information:** In an experiment to determine the Mr of a volatile liquid, 0.160 g of the volatile liquid were weighed out on a 3dp electronic balance. The liquid was allowed to vaporise in a gas syringe at 80°C and the volume of vapour measured.

**Q163-06** Calculate the percentage error in the mass of the liquid. [P = 1 atmosphere, Universal gas constant = 8.314]

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**Q163-07** If the volume of vapour obtained in question 6 was 62cm<sup>3</sup> and the accuracy of the gas syringe were  $\pm 0.5$ cm<sup>3</sup> calculate the percentage error in the gas measurement.

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**Q163-08** Calculate the relative molecular mass of the volatile liquid

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**Q163-09** If the inaccuracy of the thermometer is  $\pm 0.25$  °C calculate the total percentage error of the final relative molecular mass.

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**Q163-10** Calculate the absolute error in the relative molecular mass.

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