Chemistry

Standard level

Paper 1B

Practice paper

Topic: Acid/Base Chemistry

Chemistry

Standard level

Paper 1B

Specimen paper

45 minutes

Instructions to candidates

- Answer all questions.
- Answers must be written within the answer boxes provided.
- A calculator is required for this paper.
- The maximum mark for paper 1B is [20 marks].

Section B

1. A student determines the concentration of a solution of ethanoic acid, $CH_3COOH(aq)$, by titrating a 25.0 cm^3 sample with 0.100 mol dm^{-3} sodium hydroxide, NaOH(aq), using an indicator.

	Trial 1	Trial 2	Trial 3
Final burette reading / cm^3	26.30	25.10	49.90
Initial burette reading / cm^3	0.00	0.20	25.10
Titre volume / cm^3	26.30	24.90	24.80

(a) Calculate the average volume of NaOH(aq) added, identifying any anomalous data. **[2]**

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(b) Calculate the amount, in mol, of NaOH(aq) used in the average titre. **[1]**

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(c) Calculate the concentration of the original ethanoic acid solution. **[2]**

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(d) Ethanoic acid is a weak acid. Outline what is meant by the term "weak acid". **[1]**

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(e) State an indicator that would be suitable for this titration, using the data booklet. **[1]**

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2. A student reacts 2.50 g of calcium carbonate, $CaCO_3(s)$, with 50.0 cm^3 of 1.00 mol dm^{-3} hydrochloric acid, HCl(aq).

(a) Formulate the balanced chemical equation, including state symbols, for this reaction. **[2]**

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(b) Determine which reactant is the limiting reactant. Show your working clearly. **[3]**

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(c) Calculate the volume of carbon dioxide gas produced at standard temperature and pressure (STP). **[2]**

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(d) The experiment is repeated using an equal concentration and volume of ethanoic acid instead of hydrochloric acid. Predict the effect on the rate of gas production and the total final volume of gas produced. **[2]**

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