InkChemistry

QUESTION WORKBOOK

Concentration, volumetric solutions and titration calculations

Amount of substance · Unit C02

AQA 3.1.2.5; RP1 · OCR A 2.1.3; PAG 2

14 questions · 44 marks

NAVY SCREEN EDITION

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SECTION A · Short, 1 to 2 marks

A1 CVS-Q1
State what is meant by concordant titres, and state which titres are used to calculate the mean titre. [2]

A2 CVS-Q11
Explain why a rough titration is carried out before the accurate titrations. [2]

A3 CVS-Q12
Suggest why a back titration is used to find the calcium carbonate content of an indigestion tablet, rather than titrating the tablet directly with acid. [2]

A4 CVS-Q13
Suggest why solid sodium hydroxide is not used to make a standard solution by weighing. [2]

SECTION B · Standard, 3 to 5 marks

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B1 CVS-Q4 Calculate the concentration of a sulfuric acid solution, given that 20.50 cm^3 of it neutralises 25.0 cm^3 of 0.100 mol dm^{-3} sodium hydroxide: $H_2SO_4(aq) + 2NaOH(aq) \rightarrow Na_2SO_4(aq) + 2H_2O(l)$. [4]

B2 CVS-Q5 Calculate the mass of anhydrous sodium carbonate, Na_2CO_3, needed to make 250 cm^3 of a 0.100 mol dm^{-3} standard solution, and the concentration of that solution in g dm^{-3}. Use Na 23.0, C 12.0, O 16.0. [4]

B3 CVS-Q8 Explain why, in a titration of sodium carbonate solution in a conical flask with hydrochloric acid from a burette, the burette is rinsed with the acid but the flask is rinsed only with distilled water. [4]

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B4 CVS-Q3 Calculate the concentration of a sodium hydroxide solution, given that 25.0 cm^3 of it needs a mean titre of 21.85 cm^3 of 0.200 mol dm^{-3} hydrochloric acid. [3]

B5 CVS-Q7 Calculate the percentage uncertainty in a titre of 18.20 cm^3, given that each burette reading has an uncertainty of ±0.05 cm^3. [3]

B6 CVS-Q10 Explain why, when making a standard solution, the beaker and funnel are rinsed into the volumetric flask and the flask is inverted after making up to the line. [3]

B7 CVS-Q18 Calculate the concentration of lead ions in a 500 cm^3 sample of drinking water that contains 0.0250 mg of lead ions, in ppm and in mol dm^{-3}. Use Pb 207.2. [3]

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B8 CVS-Q19 Explain why sulfamic acid, H_2NSO_3H, is suitable as a primary standard for standardising a sodium hydroxide solution. [3]

B9 CVS-Q21 Show that 25.0 cm^3 of 0.100 mol dm^{-3} sodium hydroxide is neutralised by exactly 12.50 cm^3 of 0.100 mol dm^{-3} sulfuric acid: $H_2SO_4(aq) + 2NaOH(aq) \rightarrow Na_2SO_4(aq) + 2H_2O(l)$. [3]

SECTION C · Long, 6 marks or more

C1 CVS-Q15 Describe how to make a standard solution of sodium carbonate and use it in a titration to find the concentration of a solution of hydrochloric acid. [6]

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