InkChemistry

QUESTION WORKBOOK

Apparatus, techniques and safety: the twelve required practicals in outline

Working in the laboratory · Unit C00

AQA Practical skills 8 (AT a, b, d, e, g, h, k) · OCR A 1.1

15 questions · 53 marks

NAVY SCREEN EDITION

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SECTION A · Short, 1 to 2 marks

A1 ATS-Q8

Suggest why a mixture containing cyclohexane is heated with a water bath or an electric heating mantle and not with a Bunsen burner. [2]

A2 ATS-Q15

Identify the technique used to separate a liquid product that boils at 56 °C from an unreacted starting material that boils at 118 °C, and give the reason it works. [2]

SECTION B · Standard, 3 to 5 marks

B1 ATS-Q1

Describe how exactly 25.0 cm^3 of a solution is transferred into a conical flask for a titration, naming the apparatus used. [4]

B2 ATS-Q3

Explain why the cooling water enters a reflux condenser at the bottom and leaves at the top, and why the top of the condenser must not be stoppered. [4]

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B3 ATS-Q5 Describe how a liquid organic product contaminated with an acid and with water is purified, using a separating funnel. [4]

B4 ATS-Q6 Describe how an impure organic solid is purified by recrystallisation. [4]

B5 ATS-Q7 Explain the low yield, and what the melting point shows, when a student recrystallises 5.0 g of impure benzoic acid from a large volume of hot water and obtains 1.2 g of crystals that melt between 118 °C and 121 °C. Pure benzoic acid melts at 122 °C. [4]

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B6 ATS-Q14 Explain the difference between a hazard and a risk, using the dilution of concentrated sulfuric acid as the example, and how the risk of the dilution is kept low. [4]

B7 ATS-Q16 Evaluate a student's plan to prepare butanal by heating butan-1-ol with acidified potassium dichromate(VI) under reflux for thirty minutes and then distilling the mixture. Butanal boils at 75 °C, butan-1-ol at 118 °C and butanoic acid at 164 °C. [4]

B8 ATS-Q4 Explain why ethanol is heated under reflux with acidified potassium dichromate(VI) to make ethanoic acid. [3]

B9 ATS-Q10 Compare filtration under gravity with filtration under reduced pressure. [3]

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B10 ATS-Q11 Calculate the mass of solid transferred, and its percentage uncertainty, when a weighing bottle and solid weigh 17.62 g before the transfer and 15.48 g after, on a balance whose display reads to 0.01 g. [3]

B11 ATS-Q13 Explain why liquid bromine is dispensed only in a fume cupboard, and why bromine water is used for the test for an alkene. [3]

B12 ATS-Q17 Justify the choice of water as the solvent for recrystallising impure benzoic acid, given that benzoic acid dissolves at 2.9 g dm^{-3} in water at 20 °C and at 68 g dm^{-3} at 95 °C. [3]

SECTION C · Long, 6 marks or more

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C1 ATS-Q12 Describe the hazards, and a control measure for each, when a student prepares ethanoic acid by heating ethanol under reflux with potassium dichromate(VI) acidified with sulfuric acid, which she first dilutes from the concentrated acid.

[6]

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