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Cambridge Pre-U Certificate

CHEMISTRY

9791/04

Paper 4 Practical

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MARK SCHEME

Maximum Mark: 40

Published

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This document consists of **5** printed pages.

Question	Answer	Marks
1(a)	<p>I Records clearly the mass of weighing bottle + FA 1, mass of weighing bottle + residue, and mass of FA 1</p> <p>II Tabulates initial burette readings, final burette readings and volume of FA 2 added</p> <p>III Appropriate headings and units for titration results</p> <p>IV All accurate burette readings and the volumes of FA 2 added are given to the nearest 0.05 cm³</p> <p>V Two or more uncorrected titres within 0.20 cm³</p> <p>VI, VII, VIII Examiner calculates $\delta = \text{supervisor value} - \text{corrected scaled mean titre}$ Award VI, VII and VIII if $\delta \leq 0.15$ Award VI and VII only if $0.15 < \delta \leq 0.30$ Award VI only if $0.30 < \delta \leq 0.45$</p>	8
1(b)	Selects titres within 0.20 cm ³ , calculates the correct mean and gives answer to the same number of dp as the most precise burette reading	1
1(c)	<p>(i) Calculates correctly $\text{ans(b)} / 1000 \times 0.0100$</p> <p>(ii) Calculates correctly $5 \times \text{ans(i)}$ AND (iii) Calculates correctly $10 \times \text{ans(ii)}$</p> <p>(iv) Calculates relative formula mass of FA 1 OR mass of water in sample OR correct expression in working.</p> <p>(iv) Determines x to nearest integer.</p>	4

Question	Answer	Marks
2(a)	<p>I All 5 masses recorded have appropriate headings and units: / g or (g)</p> <p>II All 3 measured masses to the same number of dp (at least 1 dp)</p> <p>III Calculates correctly mass of FA 5 added and mass lost.</p> <p>IV and V Compare corrected mass of FA 5 / corrected mass lost with supervisor value. Award IV and V if $\delta \leq 0.20$ Award IV only if $0.20 < \delta \leq 0.40$</p>	5
2(b)	<p>(i) Use of 123.5 and 97.5</p> <p>(i) $123.5 + 97.5y$</p> <p>(ii) Initial mass of FA 5 / $(123.5 + 97.5y)$ AND (iii) (initial mass of FA 5 $\times y$) / $(123.5 + 97.5y)$</p> <p>(iv) Shows that $(ii) \times 44 + (iii) \times 18 = \text{mass lost}$</p> <p>(v) Correctly calculates a value for y to 1 dp</p>	5
2(c)	Heat to constant mass	1

Question	Answer	Marks
	FA 6 is MnCl_2 FA 7 is FeSO_4	
3(a)	(i) Clear layout of results. No repeating headings. (i) Selects NaOH and / or NH_3 (i) FA 6 : off-white / buff / beige / light-brown ppt (i) Ppt darkens (in air) Allow turns brown (i) FA 7 (dirty) green ppt (i) Ppt turns brown in air (ii) FA 6 is Mn^{2+} (ii) FA 7 is Fe^{2+}	8

Question	Answer	Marks
	FA 8 is NaNO_2 FA 9 is BaCl_2	
3(b)	(i) Decolourises with FA 8 AND white ppt with FA 9 (ii) White ppt soluble in ammonia for FA 8 and FA 9 (iii) Fizzing / effervescence / bubbles for FA 8 AND brown gas for FA 8 AND no reaction for FA 9 (iv) No reaction for FA 8 on adding AgNO_3 AND White ppt for FA 9 on adding AgNO_3 (v) FA 8 is NO_2^- (v) FA 9 is Cl^- (vi) AgNO_2 is insoluble (vi) Adding acid removed the nitrite ion	8