Chemistry

Higher level

Paper 1B

Markscheme

Question	Answers	Total
1 (a)	A strong base **and** B weak base ✔ Strong bases completely ionised **and** higher concentration of mobile ions ✔	2
1 (b) (i)	A: 1×10^{-14} ✔ C: 1×10^{-5} ✔	2
1 (b) (ii)	1×10^{9} ✔	1
1 (c) (i)	D: faster rate of reaction ✔ C: slower rate of reaction ✔	2
1 (c) (ii)	C: weak acid **and** pH 5 ✔ D: Strong acid **and** pH 1 ✔	2
1 (c) (iii)	Bases do not react with metals ✔	1
2 (a)	Different sized atoms ✔ Prevent layers from sliding easily ✔	2
2 (b)	$+2 \rightarrow +1$ ✔ Reducing agent I^- ✔	2
2 (c) (i)	$n(S_2O_3^{2-}) = 0.0315$ mol ✔	1
2 (c) (ii)	$Cu:S_2O_3^{2-} = 1:4$ ✔	1
2 (c) (iii)	$(0.0315 / 4) \times 63.55 = 0.500$ g ✔	2
2 (c) (iv)	$(0.500 / 0.750) \times 100 = 66.7$ % Cu ✔ 33.3 % Zn ✔	2

3 (a)	$C_nH_{2n+1}OH$ ✔	1
3 (b)	Increase in molar mass ✔ Stronger London dispersion forces between molecules ✔	2
3 (c)	Increasing length of non-polar hydrocarbon chain ✔	1
3 (d)	Higher boiling point ✔ Lower solubility ✔	2
4 (a)	$n(KHCO_3) = 6.96 / 100.12 = 0.0695$ mol $n(HCl) = (50.0 / 1000) \times 2.00 = 0.100$ mol $KHCO_3$ is limiting reactant ✔	2
4 (b)	$Q = 50.0 \times 4.18 \times 10.0 = 2090$ J ✔	2
4 (c)	$\Delta H = (2090 / 0.0695) = 30.0$ kJ mol^{-1} ✔	2
4 (d)	Heat loss to surroundings ✔	1
4 (e)	$\Delta H_1 = \Delta H_2 - \Delta H_3$ $\Delta H_1 = (2 \times 30.0) - (-34.0)$ $\Delta H_1 = 94$ kJ mol^{-1} ✔	3