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[Turn over

Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1: Marks must be awarded in line with: • the specific content of the mark scheme or the generic level descriptors for the question • the specific skills defined in the mark scheme or in the generic level descriptors for the question • the standard of response required by a candidate as exemplified by the standardisation scripts.
GENERIC MARKING PRINCIPLE 2: Marks awarded are always **whole marks** (not half marks, or other fractions).
GENERIC MARKING PRINCIPLE 3: Marks must be awarded **positively**: • marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate • marks are awarded when candidates clearly demonstrate what they know and can do • marks are not deducted for errors • marks are not deducted for omissions • answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.
GENERIC MARKING PRINCIPLE 4: Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
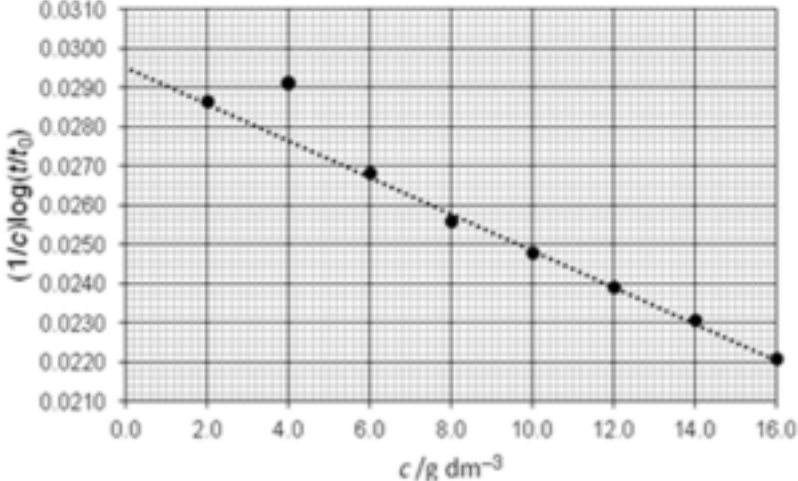
GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Question	Answer	Marks
1(a)(i)	**M1:** moles of Y_2O_3 $= 0.750 \div (2 \times 88.9 + 3 \times 16.0)$ $= 0.750 \div 225.8$ $= 3.32 \times 10^{-3}$ (mol) 3.3215235×10^{-3} **M2:** mass of $BaCO_3$ $= 4 \times 3.32 \times 10^{-3} \times (137.3 + 12.0 + 3 \times 16.0)$ $= 4 \times 3.32 \times 10^{-3} \times 197.3$ $= 2.62$ (g) 2.6213463 **M3:** mass of CuO $= 6 \times 3.32 \times 10^{-3} \times (63.5 + 16.0)$ $= 6 \times 3.32 \times 10^{-3} \times 79.5$ $= 1.58$ (g) 1.5813667	3
1(a)(ii)	**heat** solid again (and allow to cool) **AND** (to) constant mass	1
1(b)(i)	(Prevents) reaction of Cu^{2+} with I^- **OR** (prevents) formation of CuI / Cu^+ / copper(I) **OR** (prevents) oxidation of I^- (to I_2) by Cu^{2+}	1
1(b)(ii)	I^- is oxidised (to I_2) in acidic solution	1
1(b)(iii)	2A	1
1(c)(i)	$1.0 \times 250.0 / 1000 \times 294.0 = 73.5$ (g)	1
1(c)(ii)	**M1:** Dissolve / make a solution in (beaker) in (small volume of distilled water) **M2:** **Add / transfer solution** to a <u>250 cm^3</u> <u>volumetric flask</u> **M3:** Make to mark of (volumetric) flask with distilled water and the washings	3
1(d)	**M1:** titres are not concordant **M2:** repeat titration **until concordant titres are obtained** OR improved valid experimental technique	2

Question	Answer	Marks
2(a)	**M1:** to remove (remaining) hydrochloric and nitric acid **M2:** to remove water / dry the tube	2
2(b)		3

Table for 2(b):

c	$\dfrac{1}{c}$	t	$\dfrac{t}{t_0}$	$\log\dfrac{t}{t_0}$	$\dfrac{1}{c}\log\dfrac{t}{t_0}$
16.0	**0.0625**	176	2.26	**0.354**	**0.0221**
14.0	**0.0714**	164	2.10	**0.322**	**0.0230**
12.0	**0.0833**	151	1.94	**0.288**	**0.0240**
10.0	**0.100**	138	1.77	**0.248**	**0.0248**
8.0	**0.125**	125	1.60	**0.204**	**0.0255**
6.0	**0.167**	113	1.45	**0.161**	**0.0269** **0.0268**
4.0	**0.250**	102	1.31	**0.117**	**0.0293**
2.0	**0.500**	89	1.14	**0.0569**	**0.0285**

M1: for column 2, $\dfrac{1}{c}$, to 3 SF

M2: for column 5, $\log\dfrac{t}{t_0}$, to 3 SF

M3: for column 6, $\dfrac{1}{c}\log\dfrac{t}{t_0}$, to 3 SF

Question	Answer	Marks
2(c)	 **M1:** all eight points plotted correctly **M2:** best-fit **straight** line drawn	2
2(d)(i)	**M1:** time will be greater / longer / flows more slowly (at a lower temperature)	1
	M2: solution is more viscous	1
2(d)(ii)	use a **controlled** water bath (at 25 °C)	1
2(e)	point at (4.0, 0.0286) circled **AND** timer / (initial) time started too early / timer (final) time stopped too late	1
2(f)(i)	correctly extrapolates best-fit line to vertical intercept **AND** η = intercept × 2.30	1
2(f)(ii)	**M1:** log M_r = 1.59 log η + 7.03 **M2:** M_r = 1.48 × 10^5	2
2(f)(iii)	M_r ÷ 104.0 x = 1422	1

Question	Answer	Marks
2(g)	**M1:** *a* will be higher **M2:** poly(ethenol) and water form stronger / greater intermolecular forces (than between poly(phenylethene) with methyl benzene) **OR** poly(ethenol) and water form strong(er) hydrogen bonds (which were not present before)	**2**