GradeMax

Pearson

Mark Scheme (Results)

January 2026

Pearson Edexcel International Advanced Subsidiary Level in Chemistry
Paper 01: Practical Skills in Chemistry I

WCH13/01

GradeMax

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Using the Mark Scheme

Examiners should look for qualities to reward rather than faults to penalise. This does NOT mean giving credit for incorrect or inadequate answers, but it does mean allowing candidates to be rewarded for answers showing correct application of principles and knowledge. Examiners should therefore read carefully and consider every response: even if it is not what is expected it may be worthy of credit.

The mark scheme gives examiners:
- an idea of the types of response expected
- how individual marks are to be awarded
- the total mark for each question
- examples of responses that should NOT receive credit.

/ means that the responses are alternatives and either answer should receive full credit.
( ) means that a phrase/word is not essential for the award of the mark, but helps the examiner to get the sense of the expected answer.

Phrases/words in **bold** indicate that the meaning of the phrase or the actual word is **essential** to the answer.
ecf/TE/cq (error carried forward) means that a wrong answer given in an earlier part of a question is used correctly in answer to a later part of the same question.

Candidates must make their meaning clear to the examiner to gain the mark. Make sure that the answer makes sense. Do not give credit for correct words/phrases which are put together in a meaningless manner. Answers must be in the correct context.

Quality of Written Communication

Questions which involve the writing of continuous prose will expect candidates to:
- write legibly, with accurate use of spelling, grammar and punctuation in order to make the meaning clear
- select and use a form and style of writing appropriate to purpose and to complex subject matter
- organise information clearly and coherently, using specialist vocabulary when appropriate.

Full marks will be awarded if the candidate has demonstrated the above abilities. Questions where QWC is likely to be particularly important are indicated (QWC) in the mark scheme, but this does not preclude others.

Question Number	Answer	Additional Guidance	Mark
1(a)(i)	A description that makes reference to the following points: /rod • use a platinum / nichrome wire / loop /rod **(1)** • dip into (concentrated) hydrochloric acid **(1)** • place solid on wire **and** in a non-luminous / roaring / hot / blue / colourless/ (Bunsen) **flame** **(1)**	Accept nickel / chromium alloy / NiCr Do not award just Ni or Cr Allow silica rod Allow using HCl to clean the wire / make a paste / solution Do not award any other acid Allow put into (flame) Allow "air-hole open" for description of flame Allow on / over / near / above for in	**(3)**

Question Number	Answer	Additional Guidance	Mark
1(a)(ii)	An answer that makes reference to the following point: • Ca^{2+}	Allow calcium(II) / Ca(II) Ignore just calcium/ Ca / calcium ion Do not award any other metals	**(1)**

Question Number	Answer	Additional Guidance	Mark
1(b)(i)	An answer that makes reference to the following points: • bromide or iodide is displaced / halide is a bromide or iodide **(1)** • iodine present in hexane / upper layer / purple layer/ organic layer (so halide is an iodide) **(1)**	Penalise once only in M1 and M2 reference to bromine ions/iodine ions Allow just iodide/ bromide is displaced Allow iodine/ bromine produced The displacement could be shown by an equation Allow bromine / iodine is less reactive than chlorine Allow just the colour / purple due to iodine Ignore references to solvent density	**(2)**

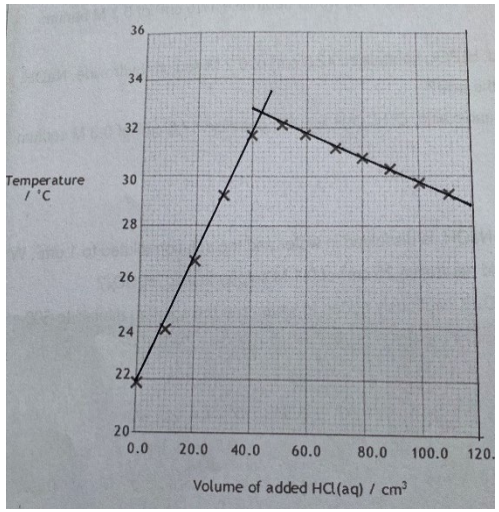
Question Number	Answer	Additional Guidance	Mark
1(b)(ii)	An answer that makes reference to the following point: • CaI_2	TE from incorrect Group 2 cation from (a)(ii) and halide anion from (b)(i) Ignore name	**(1)**

Question Number	Answer	Additional Guidance	Mark
1(c)(i)	An answer that makes reference to the following points: • (dilute) nitric acid / HNO_3((aq)) **(1)** • (aqueous) silver nitrate / $AgNO_3$((aq) **(1)**	If name and formula are given, then both must be correct Do not award sulfuric acid Do not award hydrochloric acid Ignore silver ions	**(2)**

Question Number	Answer	Additional Guidance	Mark
1(c)(ii)	An explanation that makes reference to the following points: • (the precipitate) becomes less pale / more yellow **(1)** • (because) the (white) silver **chloride** dissolves (in dilute aqueous ammonia) **(1)**	Allow the white (precipitate) dissolves Do not award the precipitates dissolve Allow the **chloride** (precipitate) dissolves Ignore references to fizzing Ignore references to addition of concentrated ammonia even if incorrect	**(2)**

Question Number	Answer	Additional Guidance	Mark
1(c)(iii)	• moles AgI in ppt **(1)** • moles CaI_2 in mixture **(1)** • mass CaI_2 in mixture **(1)** • % $CaCl_2$ in mixture **(1)**	<u>Example of calculation</u> n = 1.78 ÷ (234.8) = 7.5809×10^{-3} / 0.0075809 (mol) n = $7.5809 \times 10^{-3} \div 2 = 3.7905 \times 10^{-3}$ / 0.0037905 (mol) m= $3.7905 \times 10^{-3} \times (293.9) = 1.1140$ (g) (10.5 −1.1140) ÷ 10.5) × 100 = 89.390 / 89.4 / 89% TE from (b)(ii) and throughout Ignore SF except 1 SF If no other mark scored Allow 1 mark for ((10.5−1.78) ÷ 10.5) = 83.05%	**(4)**

(Total for Question 1 = 15 marks)

Question Number	Answer	Additional Guidance	Mark
2(a)(i)	An answer that makes reference to the following points: • two intersecting straight lines of best fit **(1)** • 43 cm^3 written in answer space or shown on graph or seen in (a)(ii) **(1)**	Example of graph  Allow ±1 small square 41−45 cm^3	**(2)**

Question Number	Answer	Additional Guidance	Mark
2(a)(ii)	• moles HCl at maximum temperature **(1)** • concentration NaOH in mol dm^{-3} **(1)**	Example of calculation (43 ÷ 1000) × 2.5 = 0.1075 (mol) 0.1075 ÷ (50 × 1000) = 2.15 (mol dm^{-3}) TE from the volume in (a)(i) Ignore SF except 1SF	**(2)**

Question Number	Answer	Additional Guidance	Mark
2(b)(i)	An answer that makes reference to the following points: • (volumetric pipette) – titre value decreased **and** because NaOH / alkali solution diluted (with remaining distilled water) **(1)** • (conical flask) – titre value unchanged **and** because there is no change in the moles(of NaOH) **(1)** • (burette) – titre value increased **and** because the HCl / acid solution would be diluted (with remaining distilled water) **(1)**	Ignore references to accuracy/ precision Allow NaOH/alkali concentration decreased Do not award concentration is the same Allow HCl concentration decreased Award (1) for three correct effects if no other mark awarded	**(3)**

Question Number	Answer	Additional Guidance	Mark
2(b)(ii)	• moles HCl in titre **(1)** • moles NaOH in 250 cm^3 diluted solution **(1)** • concentration NaOH in mol dm^{-3} **(1)**	<u>Example of calculation</u> $n = 0.223 \div 1000 \times 27.15 = 6.0545 \times 10^{-3}$ / 0.0060545(mol) $n = 6.0545 \times 10^{-2}$ (mol) $c = 6.0545 \times 10^{-2} \div 25 \times 1000 = 2.4218$ (mol dm^{-3}) Ignore SF except 1SF TE throughout Correct answer scores 3 marks	**(3)**

Question Number	Answer	Additional Guidance	Mark
2(c)	• % uncertainty calculation for flask **(1)** • % uncertainty calculation for pipette **(1)** **and** correct comparison based on candidate values	Ignore references to resolution/ precision ±0.15 ÷ 250 × 100 = 0.06 (%) ±0.04 ÷ 25 × 100 = 0.16 (%) Allow (1) if both uncertainties are doubled / halved	**(2)**

(Total for Question 2 = 12 marks)

Question Number	Answer	Additional Guidance	Mark
3(a)(i)	An answer that makes reference to the following point: • $CH_3CH_2CH_2OH + 2[O] \rightarrow CH_3CH_2COOH + H_2O$	Allow displayed/hybrid formulae Allow C_2H_5COOH for CH_3CH_2COOH Ignore use of O_2 Ignore use of molecular formulae	**(1)**

Question Number	Answer	Additional Guidance	Mark
3(a)(ii)	An answer that makes reference to the following points: • sodium dichromate((VI)) / potassium dichromate((VI)) / $Na_2Cr_2O_7$ / $K_2Cr_2O_7$ **(1)** • sulfuric acid / H_2SO_4 **(1)**	If name and formula given then both must be correct Do not award hydrochloric acid / HCl Do not award alkali Allow one mark for acidified dichromate((VI)) H^+ / $Cr_2O_7^{2-}$(aq)	**(2)**

Question Number	Answer	Additional Guidance	Mark
3(b)(i)	An explanation that makes reference to the following points: • the reaction is exothermic	Allow reference to the reaction being vigorous Do not award to prevent explosions	**(1)**

Question Number	Answer	Additional Guidance	Mark
3(b)(ii)	An answer that makes reference to the following point: • (so that the) cooling / condensation is more efficient / effective or water jacket is full / water jacket has no air bubbles	Allow (hot) vapour is next to coolest water first	**(1)**

Question Number	Answer	Additional Guidance	Mark
3(c)(i)	An answer that makes reference to the following point: • to prevent violent boiling / to prevent large bubbles forming / to encourage small bubbles / to ensure smooth / slow/ even/ boiling	Accept provides surface for bubbles to form Ignore just references to “bumps / bumping”	**(1)**

Question Number	Answer	Additional Guidance	Mark
3(c)(ii)	An answer that makes reference to the following point: • (the reaction mixture) is (in)flammable / might catch fire / no flames should be used	Allow to heat evenly / to control the temperature **rise** Ignore explosion / flask would break Do not award to prevent evaporation Do not award to keep the temperature constant	**(1)**

Question Number	Answer	Additional Guidance	Mark
3(c)(iii)	An explanation that makes reference to the following points: • the (evaporated) propanal is condensed **(1)** • so returned to the flask/ oxidising agent **(1)**	Allow reference to dripping/ flowing etc which implies liquified Allow not being removed from the apparatus/ oxidising agent	**(2)**

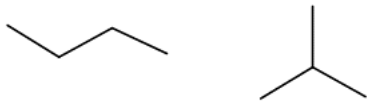
Question Number	Answer	Additional Guidance	Mark
3(d)	An explanation that makes reference to the following points: • to measure the temperature (of the vapour) **(1)** • to enable the distillate to be removed from the mixture **(1)** • the boiling temperature of propanoic acid is over 100°C / the propanoic acid would not boil / distil (if water was used) **(1)**	Allow propanoic acid for distillate throughout Allow to prevent the escape of vapour/ gas Do not award temperature of liquid/ in the flask Allow so that distillate collects in conical flask/ another vessel Allow distillate is not returned to pear-shaped flask Allow oil has a higher boiling temperature than propanoic acid Ignore comparisons of density/ heat capacity	**(3)**

Question Number	Answer	Additional Guidance	Mark
3(e)	An answer that makes reference to the following points: • add (aqueous) sodium carbonate / Na_2CO_3 / sodium hydrogencarbonate / $NaHCO_3$ / **(1)** magnesium (ribbon) / Mg • fizzing / bubbles / effervescence **(1)**	Allow any named carbonate/ hydrogencarbonate Allow zinc / Zn Allow correct test for CO_2 or H_2 Ignore just carbon dioxide given off Allow Test :add an alcohol **and** with a strong acid catalyst Result: sweet / fruity / ester smell M2 dependent on M1 or near miss	**(2)**

(Total for Question 3 = 14 marks)

Question Number	Answer	Additional Guidance	Mark
4(a)	An answer that makes reference to the following points: • flammable **(1)** • harmful / irritant **(1)**	 Allow inflammable Accept moderate hazard Allow health hazard	**(2)**

Question Number	Answer	Additional Guidance	Mark
4(b)(i)	• moles of gas **(1)** • M_r of hydrocarbon **(1)**	Example of calculation 750 ÷ (24 × 1000) = 0.03125 (mol) 1.81 ÷ 0.03125 = 57.92 / 57.9 / 58	**(2)**

Question Number	Answer	Additional Guidance	Mark
4(b)(ii)	An answer that makes reference to the following point: • skeletal formula	 TE on bi If two skeletal formula given, both must be correct Ignore structural/ displayed formulae as working	**(1)**

Question Number	Answer	Additional Guidance	Mark
4(b)(iii)	An answer that makes reference to the following point: • to ensure that the (hydrocarbon) gas is at atmospheric pressure	Ignore just to relieve the pressure	**(1)**

Question Number	Answer	Additional Guidance	Mark
4(c)	An explanation that makes reference to the following points: • loss in mass would be smaller **(1)** • so M_r would be smaller / less **(1)**	Allow the final mass would be higher than expected M2 dependent on M1	**(2)**

Question Number	Answer	Additional Guidance	Mark
4(d)	An answer that makes reference to the following point: • carbon dioxide dissolves in water / reacts with water	Ignore loss of gas Ignore any comments on change in M_r	**(1)**

(Total for Question 4 = 9 marks)

TOTAL FOR PAPER = 50 MARKS