

APOLLO

Counting particles by mass: The mole SL

Chemistry

First assessment 2025

8 questions | mark schemes

Mark-scheme answers

Chemistry SL | Paper 1A | May 2025 TZ2 | Q5 | 1 marks

5. D

Chemistry SL | Paper 1A | May 2025 TZ3 | Q1 | 1 marks

1. D

Chemistry SL | Paper 1A | May 2025 TZ3 | Q2 | 1 marks

2. B

5.	(a)		AND $C = 2.59 \text{ «g»} \checkmark$ $\ll m(O) = 4.32 - (m(C) + m(H))$ $= 4.32 - (2.59 + 0.581) = 1.15 \text{ g} \gg$ $n(O) = \frac{1.15 \text{ g}}{16.00 \text{ g mol}^{-1}} \quad / 0.0718 \text{ «mol»} \checkmark$ $\ll m(C):n(H):n(O) = 0.216 : 0.575 : 0.0718 = 3 : 8 : 1 \gg$ $C_3H_8O \checkmark$	<i>M3 for finding empirical formula Award [3] for correct final answer.</i>	3
5.	(b)	(i)	$T = 373 \text{ K AND } V = 5.57 \times 10^{-5} \text{ m}^3$ OR $T = 373 \text{ K AND } 0.0557 \text{ dm}^3 \text{ and } 1 \times 10^2 \text{ kPa} \checkmark$ $\ll n = \frac{PV}{RT} = \frac{1.00 \times 10^5 \text{ Pa} \times 5.57 \times 10^{-5} \text{ m}^3}{8.31 \text{ J K}^{-1} \text{ mol}^{-1} \times 373 \text{ K}} \gg$ $n = 0.00180 \text{ «mol»} \checkmark$	<i>Award [2] for correct final answer.</i>	2
5.	(b)	(ii)	$\ll M = \frac{0.108 \text{ g}}{0.00180 \text{ mol}} \gg$ $60.0 / 60.1 \text{ «g mol}^{-1}\gg \checkmark$	<i>If $n = 0.00220 \text{ mol}$ is used, $M = 49.1 \text{ «g mol}^{-1}\gg$</i> <i>Accept mass of 60</i>	1

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Question	Answers	Notes	Total
	H. .CH ₃	Accept any correct structural	

Mark-scheme answers

Chemistry SL | Paper 1A | Nov 2025 TZ1 | Q4 | 1 marks

4. D

Chemistry SL | Paper 1A | Nov 2025 TZ3 | Q3 | 1 marks

3. C

Chemistry SL | Paper 1A | Specimen 2025 | Q4 | 1 marks

4. A

1.	(a)	$n_H = \frac{66.66 \text{ g}}{1.01 \text{ g mol}^{-1}} = 6.66 \text{ «mol»}$ $n_O = \frac{53.28 \text{ g}}{16.00 \text{ g mol}^{-1}} = 3.33 \text{ «mol»} \checkmark$ $\text{CH}_2\text{O} \checkmark$		2
1.	(b)	$n_{\text{HX}} (= n_{\text{NaOH}}) = 0.750 \text{ «mol dm}^{-3}\text{»} \times 0.02230 \text{ «dm}^3\text{»} / 0.0167 \text{ «mol»} \checkmark$ $M_{\text{HX}} = \left(\frac{1.51 \text{ g}}{0.0167 \text{ mol}} \right) = 90.4 \text{ g mol}^{-1} \checkmark$	Accept 90.3 «g mol ⁻¹ ».	2
1.	(c)	$\text{C}_3\text{H}_6\text{O}_3 \checkmark$	Accept consistent feasible structural formula.	1
1.	(d)	carboxyl/COOH $\checkmark$	Do not accept "carbonyl/C=O".	1

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Question	Answers	Notes	Total
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