

These are the errors Cambridge’s examiners report every session, ordered by how often they raise them. The × line is what candidates write; the ✓ line is what scores. 下列都是考官每年都点名的失分点。×是常见写法,✓是能得分的写法。*General exam technique is in the Exam Technique guide; this booklet is Chemistry.*

Across every paper

- ✗ Answering an EXPLAIN question with the rule alone – ‘because it is more electronegative’.
- ✓ Give the chain: more protons, similar shielding, so a stronger attraction for the bonding pair, so a higher electronegativity.

The most repeated point in the reports. A rule of thumb states a fact; an explanation shows how the facts combine.

“解释”要写出因果链

ER 6 sessions P4
- ✗ Writing a paragraph where three precise phrases were wanted.
- ✓ Be concise and use the chemical terms exactly. Full sentences are rarely needed.

Examiners praise concise, precise answers in every report. Accurate terminology is what removes ambiguity, not length.

答案要简洁准确

ER 4 sessions P4
- ✗ Writing the final number of a calculation with no working above it.
- ✓ Show each step, including the mole calculation, so partial credit survives an arithmetic slip.

Where an answer can be reached several ways, working is the only evidence of the right one.

计算要写过程

ER 8 sessions P4
- ✗ Rounding a mole value to two figures and then using it in the next line.
- ✓ Carry the full value through and round once at the end.

Examiners describe early rounding as leading to sizeable inaccuracies later – the final answer then falls outside the accepted range.

中途不要四舍五入

ER 8 sessions P4
- ✗ Giving one significant figure, or the calculator’s full display, when the question sets no number.
- ✓ Match the data: three significant figures is usually right, and one is almost never enough.

The precision of the concentrations and masses given in the question sets the precision of the answer.

有效数字看题目数据

ER 4 sessions P4
- ✗ Listing five answers when the question asked for two, to be safe.
- ✓ Give exactly the number asked for, and choose which ones.

Extra answers are marked, and a wrong extra is penalised – offering more than was asked can cost the mark a right answer had earned.

问几个就写几个

ER 2 sessions P4

- ✗ Writing the corrected answer on top of the old one.
- ✓ Cross the old answer out clearly and write the new one beside it.

Examiners raise legibility in five separate reports. An overwritten answer that cannot be read cannot be credited.

改答案要划掉重写

ER 5 sessions P4
- Learn each syllabus definition word for word. Examiners note that missing one key word – ‘metal’, ‘ligand’, ‘standard’ – is enough to lose the mark.

定义要逐字背准

ER 3 sessions P4; EX P4

2 · Atoms, molecules and stoichiometry 原子、分子与化学计量

- ✗ Using the moles of the reagent in excess in a limiting-reagent calculation.
- ✓ Identify the limiting reagent first, then work from its moles.

A named common error: 0.0150 mol HCl was used where 0.00658 mol Mg was limiting, so every later value was wrong.

先找限量试剂

EX P4
- ✗ Leaving an equation unbalanced for charge, or leaving spectator ions in an ionic equation.
- ✓ Balance atoms AND charge, then cancel every species that appears unchanged on both sides.

Examiners state this in three separate reports. An ionic equation with spectators in it is not an ionic equation.

原子和电荷都要配平

ER 3 sessions P4
- ✗ Answering in g dm⁻³ when the answer line is marked mol dm⁻³.
- ✓ Read the unit printed at the end of the answer line before you start.

Examiners point specifically at calculations where a factor of 1000 hangs on that unit.

看清答题线上的单位

EX P5
- ✗ Giving the enthalpy change for 2 mol when the question asked for 1 mol.
- ✓ Check what the equation as written represents, then scale.

Many candidates calculated the decomposition of 2 mol HI correctly and never divided, losing a mark they had done the work for.

看清是几摩尔

EX P4

3 · Chemical bonding 化学键

- ✗ Drawing a d-orbital with its lobes along the x and y axes.
- ✓ **The d_{xy} lobes lie BETWEEN the axes; only $d_{x^2-y^2}$ lies along them.**

Examiners record many candidates drawing the wrong shape, which then wrecks the crystal-field explanation built on it.
d 轨道的形状要画准EX P4
- ✗ Calling an octahedral complex ion polar because its ligands are polar.
- ✓ **Check the symmetry: in a symmetrical octahedral or linear ion the dipoles cancel.**

The most common incorrect answer in that question. Polarity is a property of the whole ion, not of one bond.
对称结构无极性EX P4
- ✗ Explaining a lattice-energy trend by ionic size alone.
- ✓ **Say what the size does: a larger cation is further from the anion, so the attraction between the ions is weaker.**

Examiners note candidates recognising that Cd^{2+} is larger than Zn^{2+} but never stating the consequence.
写出“吸引力更弱”EX P4

5 · Chemical energetics 化学能量学

- ✗ Treating ‘standard conditions’ and ‘standard states’ as the same phrase.
- ✓ **Standard conditions are 298 K and 100 kPa; the standard state is the physical form stable under them.**

Named as a misconception. Carbon exists as two crystalline solids at room temperature, so the state has to be specified separately.
标准条件 ≠ 标准状态EX P4
- ✗ Using only the mass of the alkali in $q = mc\Delta T$.
- ✓ **Use the TOTAL mass of solution in the cup – acid plus water plus alkali.**

A named error: 10.0 + 10.0 cm³ makes 20 g, and using 10 g halves every energy that follows.
用溶液总质量EX P5
- ✗ Confusing enthalpy change of solution with enthalpy of solubility, or losing track of which term changed more.
- ✓ **Write the cycle out and name each term before comparing them.**

Examiners list both confusions together; the arithmetic is easy once the cycle is on paper.
先画能量循环EX P4

7 · Equilibria 平衡

- ✗ Defining equilibrium as ‘the concentrations of reactants and products are equal’.
- ✓ **The concentrations stay CONSTANT, and the forward and backward rates are equal.**

A named common error. Equal concentrations are a special case and usually untrue.
浓度不变, 不是相等EX P4

- ✗ Saying the equilibrium ‘shifts to the right’ when the question is about a stability constant.
- ✓ **A K value describes the position of the equilibrium at that temperature; it does not shift because a value differs.**

Listed as a common error – the reasoning imports Le Chatelier where the question asked about K .
K 值不随浓度移动EX P4
- ✗ Answering a ‘use Le Chatelier’s principle’ question with the common ion effect.
- ✓ **Use the principle the question names, in its own terms.**

Examiners state that answers based on other reasoning were ignored, however chemically sound they were.
题目指定的原理才算EX P4
- ✗ Writing curly brackets in a K_{stab} or K_c expression.
- ✓ **Square brackets, always: $K_c = \frac{[\text{C}]^2}{[\text{A}][\text{B}]}$.**

Listed among the common incorrect responses. The bracket is part of the notation being tested.
平衡常数用方括号EX P4

9 · The Periodic Table: chemical periodicity 元素周期表: 化学周期性

- ✗ Explaining an ionisation-energy trend by saying the nuclear charge increases, and stopping.
- ✓ **Finish it: the attraction between the nucleus and the outer electron decreases down the group because the electron is further away and better shielded.**

Examiners state explicitly that explanations often did not mention the attraction decreasing – the step that carries the mark.
要写“吸引力减小”EX P4
- ✗ Describing the second electron affinity as repulsion between two electrons.
- ✓ **It is repulsion between the incoming electron and the negatively charged ANION.**

Examiners say the anion must be named; a general statement about electron repulsion was not sufficient.
是电子与负离子之间的排斥EX P4

13 · An introduction to AS Level organic chemistry AS Level 有机化学导论

- ✗ Drawing a curly arrow starting at an atom rather than at a bond or a lone pair.
- ✓ **Start every arrow at an electron pair and end it where that pair goes.**

Examiners state that the start and finish points ARE the description of the mechanism, so a vague arrow scores nothing.
弯箭头起点是电子对ER 2 sessions P4
- ✗ Naming a compound without checking the number of carbons in the chain the question drew.
- ✓ **Count the chain, then name the longest one containing the functional group.**

Examiners report answers that describe the right chemistry on the wrong molecule.
先数主链碳数ER Nov24 P22

17 · Carbonyl compounds 羰基化合物

- ✗ Saying ethanoic acid gives a positive result with an oxidising agent.
- ✓ **Ethanoic acid has no –CHO group, so it cannot be oxidised under those conditions.**
Examiners name this directly. A carboxylic acid is already at that oxidation level.
乙酸不能再被氧化 EX P5
- ✗ Identifying an acid by effervescence with magnesium alone.
- ✓ **Add a test that separates them, since every acid in the set effervesces with magnesium.**
Examiners note that more explanation was needed for methanoic acid than for hydrogen peroxide – a shared observation identifies nothing.
共有现象不能区分 EX P5

22 · Analytical techniques 分析技术

- ✗ Writing a mass-spectrum fragment without its positive charge.
- ✓ **Every fragment detected in a mass spectrometer is a positive ion: $^+\text{COOH}$.**
Stated flatly by the examiners. An uncharged fragment would never reach the detector.
碎片都是正离子 EX P4
- ✗ Saying a molecule ‘has optical isomers’ when asked what an optically active substance does.
- ✓ **It ROTATES the plane of POLARISED light.**
Examiners record candidates missing the key words ‘rotate’ and ‘polarised’ – the two words the mark is for.
旋光: 旋转偏振光平面 EX P4

The practical papers – Paper 3 and Paper 5

- ✗ Making up a standard solution with a measuring cylinder.
- ✓ **Use volumetric apparatus – burette, pipette, volumetric flask – where accuracy is required.**
Examiners state this as a standing expectation; the apparatus chosen is itself assessed.
配标准液要用容量仪器 ER 2 sessions P3
- ✗ Treating a measuring cylinder as needing two readings when calculating its uncertainty.
- ✓ **One reading, and the error is half a graduation.**
Both mistakes are listed as common errors, and each doubles or halves the percentage uncertainty.
量筒只读一次 EX P5
- ✗ Recording 25 cm^3 from a burette.
- ✓ **Record to the precision of the apparatus: 25.00 cm^3 from a burette, 25.0 cm^3 from a pipette.**
Examiners require the data to reflect the precision of the apparatus used; trailing zeros are significant here.
读数体现仪器精度 ER 2 sessions P3

- ✗ Plotting the points and drawing the line freehand, or not drawing one at all.
- ✓ **Use a ruler, and draw the line even if the points scatter – it carries error-carried-forward marks.**
Listed as a common error. A missing line loses the marks that depended on it as well as its own.
一定要用直尺画拟合线 EX P5
- ✗ Taking gradient coordinates from the data table.
- ✓ **Take them from two well-separated points ON the line of best fit.**
Named as a common error, together with misread and transposed coordinates.
斜率取线上的点 EX P5
- ✗ Suggesting ‘use a lid’ or ‘repeat the experiment’ as an improvement.
- ✓ **Name the measurement that was hard and the change that fixes it.**
Examiners record ‘use a lid’ as a common response that ignored the instructions actually given in the task.
改进要针对本实验 EX P5
- ✗ Calling unreacted solid a ‘precipitate’.
- ✓ **Use the term that describes what it is: undissolved or unreacted solid.**
Examiners state that both marks could not be awarded – chemistry-specific language has to be used correctly.
未反应固体不是沉淀 EX P5
- ✗ Answering an ion test with ‘magnesium’.
- ✓ **Name the ion with its charge: Mg^{2+} .**
Examiners call this an incomplete answer: a cation has a charge, and the charge is part of the identification.
阳离子要写电荷 EX P5
- ✗ Removing an oxide layer from magnesium with dilute acid.
- ✓ **Abrade it – emery paper or sandpaper.**
A named common incorrect answer: dilute acid attacks the magnesium underneath as well.
用砂纸去氧化层 EX P5
- The molar gas volume and other constants are printed in the ‘Important values, constants and standards’ section of the paper. Look there before assuming a value.
常数在试卷上有 EX P5