AP Chemistry

Common Mistakes · 常见错误

AP Chemistry rewards particle-level reasoning and penalises assertion. An answer that states a trend without the Coulombic or structural reason earns a fraction of the marks, and an answer with no units or no working earns fewer still. 化学重在微粒层面的解释: 只写结论、不写原因不得分。

Explanation

Stating a periodic trend without a reason. 'Ionisation energy increases across a period' needs increasing effective nuclear charge at roughly constant shielding.

Explaining a boiling-point difference by 'stronger bonds' when the answer is stronger INTERMOLECULAR FORCES. The covalent bonds are not broken on boiling.

Saying a reaction is 'faster because particles move faster'. The mark needs more frequent collisions AND a greater fraction exceeding the activation energy.

Describing a catalyst as 'lowering the activation energy of the reaction'. It provides an alternative pathway with a lower activation energy.

Answering a 'justify' question with a restatement instead of the data or the principle it rests on.

Calculations

Omitting units, or carrying them incorrectly. Dimensional analysis is the expected method and is credited.

Reporting more significant figures than the data support, or rounding intermediate values and carrying them forward.

Using concentration in mol/L with a volume in mL. Convert first.

Taking mole ratios from the formula rather than from the BALANCED equation.

Forgetting that Kelvin is required in every gas-law and thermodynamic calculation.

Writing an answer with no set-up. A correct number alone forfeits the working marks; a wrong number with correct set-up keeps most of them.

Equilibrium, acids and thermodynamics

Including solids and pure liquids in an equilibrium expression. Only gases and aqueous species appear.

Saying a catalyst shifts the position of equilibrium. It changes the rate at which equilibrium is reached, not where it lies.

Confusing a strong acid with a concentrated one – strength is the extent of dissociation, concentration is amount per volume.

Treating the equivalence point of a weak-acid titration as pH 7. It is above 7, because the conjugate base is present.

Saying a reaction with a positive ΔG 'cannot happen'. It is not thermodynamically favourable under those conditions; coupling or a temperature change can alter that.

Confusing thermodynamic favourability with rate. A favourable reaction can be immeasurably slow.

Laboratory reasoning

Rinsing a burette with water instead of the titrant, and not saying why the difference matters.

Deriving a rate law from the coefficients in the balanced equation. Orders come only from experimental data.

Reading an unknown concentration off a calibration line beyond the range measured.

Naming an error without saying which direction it moves the result.