

Commentary on candidate evidence

Assessors awarded the candidate evidence contained in this pack the following marks for questions 4 and 9 of the 2026 Advanced Higher question paper, section 2.

Question 4

Candidate 1

The candidate was awarded **2 marks** because they have demonstrated a reasonable understanding of the chemistry involved.

The candidate has provided a detailed account of how gravimetric analysis can be used to determine the $\text{CuSO}_4 \cdot \text{H}_2\text{O}$ ratio in the formula. While not at Advanced Higher level, the account of using flame colour to determine the presence of copper is relevant to the question. If the candidate expanded on this into correct atomic emission theory, this would have been enough to have been awarded three marks.

Candidate 2

The candidate was awarded **0 marks** because they have given a less than limited account.

The candidate has given a brief description of recrystallisation, which is not relevant to the question. The candidate goes on to give an incorrect description of how the $\text{CuSO}_4 \cdot \text{H}_2\text{O}$ ratio in the formula may be deduced.

Candidate 3

The candidate was awarded **0 marks** because they have given a less than limited account.

The candidate has simply listed some techniques that may be used to determine the formula but has given no indication of how each technique may be used. A list on its own is not sufficient.

Candidate 4

The candidate was awarded **2 marks** because they have demonstrated a reasonable understanding of the chemistry involved.

The candidate has provided a detailed account of how gravimetric analysis can be used to determine the $\text{CuSO}_4 \cdot \text{H}_2\text{O}$ ratio in the formula. The description of a technique at the end matches recrystallisation. This is not relevant and is ignored.

Candidate 5

The candidate was awarded **3 marks** because they have demonstrated a good understanding of the chemistry involved.

The candidate has provided a detailed account of how gravimetric analysis can be used to determine the $\text{CuSO}_4 \cdot \text{H}_2\text{O}$ ratio in the formula. What makes this a better account than others that have only described the gravimetric technique, is the inclusion of the exact calculations that would be necessary to calculate the ratio. The candidate also mentions flame colour, giving the actual colour that should be observed and solubility data, although these are not considered Advanced Higher level on their own.

Candidate 6

The candidate was awarded **3 marks** because they have demonstrated a good understanding of the chemistry involved.

The candidate has given an account of how atomic emission spectroscopy can be used to prove the presence of copper in the compound. The candidate has also provided a detailed account of how gravimetric analysis can be used to determine the $\text{CuSO}_4 \cdot \text{H}_2\text{O}$ ratio in the formula. The final part of the candidate's account describes using melting point analysis to prove the identity of the compound. This is not appropriate for this compound as it does not have a melting point and decomposes on heating. However, the candidate would not know this, and so marks can still be awarded.

Candidate 7

The candidate was awarded **1 mark** because they have demonstrated a limited understanding of the chemistry involved.

The candidate has given a limited description of how emission spectroscopy may be used to identify the elements present in the compound. A limited description of the use of mass spectrometry to detect water is also given but would not lead to a determination of the ratio. The candidate's explanation of the compound's colour is incorrect.

Candidate 8

The candidate was awarded **1 mark** because they have demonstrated a limited understanding of the chemistry involved.

The candidate has stated two analytical techniques and given a general account of what information is collected from each. The account is limited as the candidate does not relate the information to the compound in the question.

Question 9

Candidate 1

The candidate was awarded **3 marks** because they have demonstrated a good understanding of the chemistry involved.

A full account of how the indicator equilibrium is affected by the addition of acid or base is provided. The candidate has also correctly described how a buffer solution works, although the stated effects on the equilibrium are not correct. The candidate has tackled both parts of the question. A good account does not need to be excellent or complete for the candidate to gain full marks, some errors are acceptable.

Candidate 2

The candidate was awarded **1 mark** because they have demonstrated a limited understanding of the chemistry involved.

The candidate has provided a definition of a buffer solution. This definition is not given in the question and so this is additional relevant information but is a limited response.

Candidate 3

The candidate was awarded **2 marks** because they have demonstrated a reasonable understanding of the chemistry involved.

The candidate has provided a correct account of how the addition of base alters the equilibrium to maintain a constant pH. The candidate also provides an account of how the equilibrium is affected by the addition of acid, although this is not complete. There is no mention of indicators in the response.

Candidate 4

The candidate was awarded **1 mark** because they have demonstrated a limited understanding of the chemistry involved.

The candidate has provided a definition of a buffer solution and an explanation of the effect of adding acid. There is no link to an equilibrium given.

Candidate 5

The candidate was awarded **0 marks** because they have given a less than limited account.

The candidate has not provided any correct relevant information that is not already given in the question stem.

Candidate 6

The candidate was awarded **0 marks** because they have given a less than limited account.

The candidate has provided an incomplete definition of a buffer solution. The information provided on indicators is not relevant to the question.

Candidate 7

The candidate was awarded **3 marks** because they have demonstrated a good understanding of the chemistry involved.

The candidate has provided a definition of an indicator and the factors that affect the colour produced. There is no reference to the equilibrium in the question, however, equilibrium is discussed as part of the definition. An explanation of how the buffer solution in the question functions is also provided, and this has been related to the equilibrium involved.

Candidate 8

The candidate was awarded **2 marks** because they have demonstrated a reasonable understanding of the chemistry involved.

The candidate has provided a definition of an indicator and made a general statement that the addition of acid or base affects the position of the equilibrium. The specific effect of acid or base on the equilibrium is not given. The candidate gives a

brief explanation of the species that react in a buffer solution to help maintain a constant pH but does not refer to their origin or the effect on the equilibrium.