

A LEVEL

Examiners' report

CHEMISTRY B (SALTERS)

H433

For first teaching in 2015

H433/03 Autumn 2021 series

Introduction

Our examiners' reports are produced to offer constructive feedback on candidates' performance in the examinations. They provide useful guidance for future candidates.



Reports for the November 2021 series will provide a broad commentary about candidate performance, with the aim for them to be useful future teaching tools. As an exception for this series they will not contain any questions from the exam paper nor examples of candidate responses.

The reports will include a general commentary on candidates' performance, identify technical aspects examined in the questions and highlight good performance and where performance could be improved. The reports will also explain aspects which caused difficulty and why the difficulties arose, whether through a lack of knowledge, poor examination technique, or any other identifiable and explainable reason.

A full copy of the exam paper and the mark scheme can be downloaded from OCR.

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Paper 3 series overview

This component assesses content from across all teaching modules with particular emphasis on practical skills.

Question styles include short response (structures questions, problem solving, calculations and practical). As ever with this specification questions are set in a range of different contexts.

This paper also includes questions based on an insert with the exam paper. The insert outlines a practical procedure and the results produced from the experiment.

There is some evidence that the effect of lockdown impacted on many students' knowledge of practical procedures in particular.

The distribution of marks was broadly similar to earlier series, however overall marks achieved by candidates tended to be lower, again perhaps reflecting the inevitable reduction of face-to-face teaching and discussion during lockdown.

<i>Candidates who did well on this paper generally did the following:</i>	<i>Candidates who did less well on this paper generally did the following:</i>
<ul style="list-style-type: none"> showed clear working in all calculations 3b(i), (ii), 4(a)(i), (ii), 4(c) were able to attempt all questions were able to construct a well-reasoned, logical response to the longer answer Questions 1(d), 4(d) displayed a sound understanding of organic reactions based on functional groups. 	<ul style="list-style-type: none"> did not provide a response to several questions did not clearly set out calculations found difficulty applying the relevant chemistry to differing, perhaps unfamiliar contexts, e.g. 2(b)(ii) had difficulty identifying and explaining different types of bonding (both intra and intermolecular).

Section overview

Question 1

This was generally completed fully by the majority of candidates and discriminated well between them.

The Level of Response Question 1(d) was challenging for students (further comments on this question are provided in the later section).

Question 2

Overall, this question was reasonably well-answered. 2(b)(ii), the structures of the two organic products, proved difficult as did the explanation of the differences in effectiveness of the enantiomers in 2(c)(iii).

Question 3

Not quite as well-answered, overall, as the two previous questions. The identification of the coloured layers, 3a(ii), proved the most difficult question on the paper. The lack of hands-on practical may well have had an impact here.

Structures and relative water solubility of iodine and potassium iodide also proved difficult for candidates to explain in 3(c).

Question 4

This was the least well-answered question although there was some evidence of candidates running out of time, or not reading the insert carefully enough.

In Question 4(b) many candidates found it difficult to produce the appropriate equation and 4(d) lacked detailed explanations (discussed in next section).

Comments on responses by question type

Level of response questions

Candidates found the two level of response questions on this paper particularly difficult.

As the questions focused on practical techniques, this may have been a consequence of a lack of hands-on practical experience compared to previous cohorts.

Question 1(d)

This question was based around the synthesis and production of an organic liquid. Many candidates chose the wrong practical technique and discussed the purification procedures for the synthesis of an organic solid.

Question 4(d)

This question needed candidates to have carefully studied the practical insert included with the paper.

This outlined a student investigation of pH changes in a variety of solutions.

Responses were commonly vague and lacking in detail. Explanations for changes in pH, or more pertinently little change in buffer solutions, were often missing, with candidates only therefore scoring at Level 1 for identifying the buffer solution.

Common misconceptions

	Misconception	Some candidates considered the potassium iodide in Question 3(c) to be a polar covalent molecule, quoting the difference in electronegativity as the reason.
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Key teaching and learning points – comments on improving performance

Explanations by candidates need to be in line with the marks available for the question. More detail is usually required for 3 or 4 mark questions (and of course the level of response questions), e.g. Questions 2c(ii), 3c and 4(b).

Many candidates lack structure in their working out of calculations which involve several steps. This often leads to marks being lost unnecessarily.

The use of 'curly arrows' in organic mechanisms is often unclear. Candidates should clearly show where the pair of electrons is coming from, e.g. bond or lone pair, and the arrowhead should indicate where the electron pair is going.

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