

A Level Chemistry B

Nucleophilic reactions between carbonyl compounds and hydrogen cyanide

Instructions and answers for teachers

These instructions should accompany the OCR resource 'Nucleophilic reactions between carbonyl compounds and hydrogen cyanide' activity which supports OCR A Level Chemistry B.

The screenshot shows a worksheet titled 'A level Chemistry B' with the following content:

Nucleophilic reactions between carbonyl compounds and hydrogen cyanide
Task 1 Nomenclature
For the following molecules, give their systematic names.

Structure 1: CCC=O (Propanal)

Structure 2: CCCC=O (Butanal)

Each structure is followed by a blank box for the answer.

The Activity:

This resource comprises of 2 tasks.

This task assists pupils with the following specification statement:

3.4 A2 Unit F334: Chemistry of Materials

3.4 WM k) describe the mechanism of the nucleophilic addition reaction between a carbonyl compound and hydrogen cyanide, using curly arrows and bond polarities.



This activity offers an opportunity for English skills development.



This activity offers an opportunity for maths skills development.

Associated materials:

'Nucleophilic reactions between carbonyl compounds and hydrogen cyanide' Lesson Element learner activity sheet.

Pupils will need to be familiar with the content from AS units where they have covered the fundamental skills of organic chemistry that will be required for developing their understanding.

This task is a guided worksheet that aims to go through previous learning, and then use peer assessment and example questions to cover the required context.

When answering A2 chemistry questions there are often some misconceptions:

- Pupils can name compounds incorrectly.
- Pupils (especially those with small handwriting) can make it difficult to see if a curly arrow originates from an atom or a bond, which can lose marks.
- Pupils can confuse partial charges arising from electronegativity with full charges arising from the loss or gain of an electron.
- Pupils can fail to draw lone pairs where appropriate.
- Pupils can draw curly arrows in the wrong direction, failing to realise that a curly arrow signifies the movement of a pair of electrons.

Task instructions

Pupils should go through the worksheet. At various points the worksheet has areas that can be used for peer assessment. There are also areas that allow pupils to construct their own mechanisms.

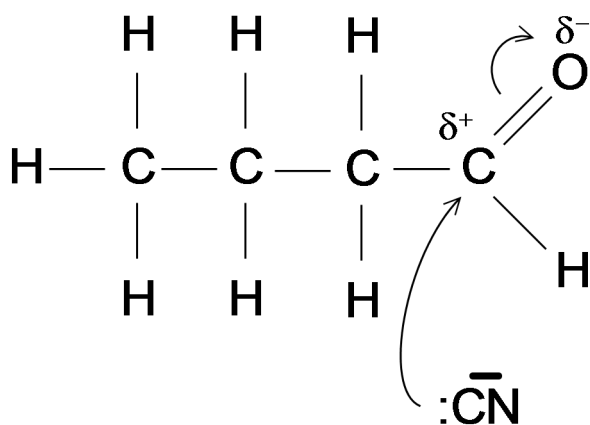
It would be preferable to break the task into sections in class, and ensure everyone understands each task before the next one, rather than giving pupils the entire task at once.

Task 1 Nomenclature

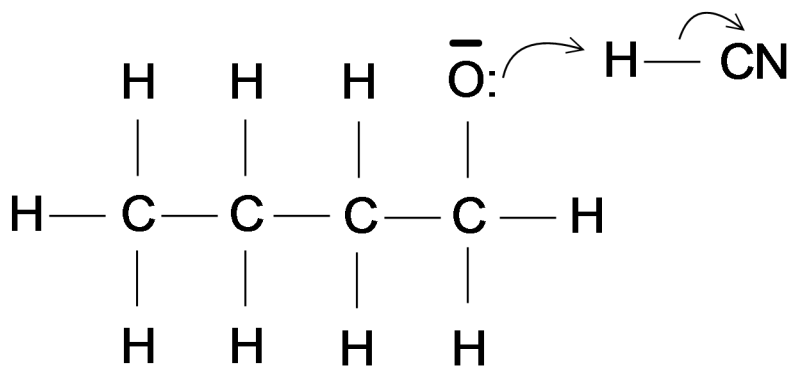
1. Propanal
2. Pentan-3-one
3. 2-Methylpentanal
4. 4, 5-dimethylheptan-3-one

Task 2 Mechanism

1. Butanal

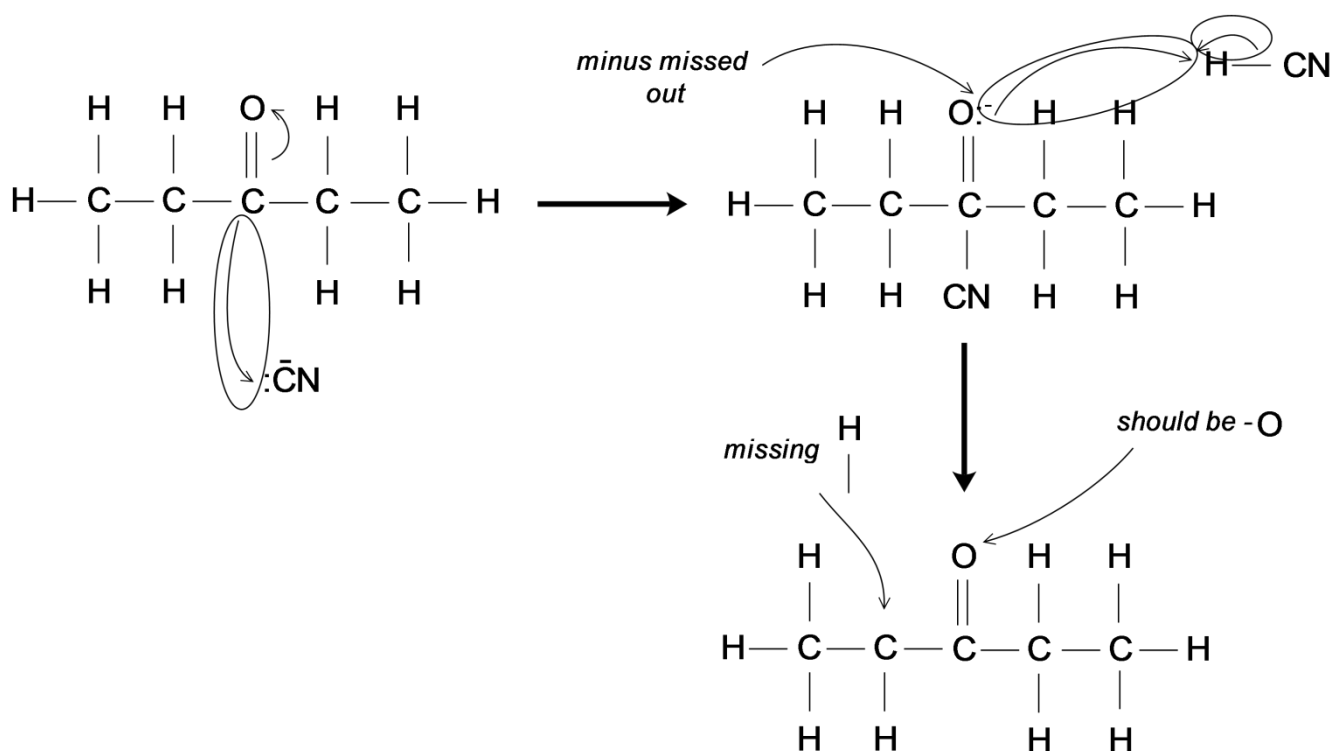


2.



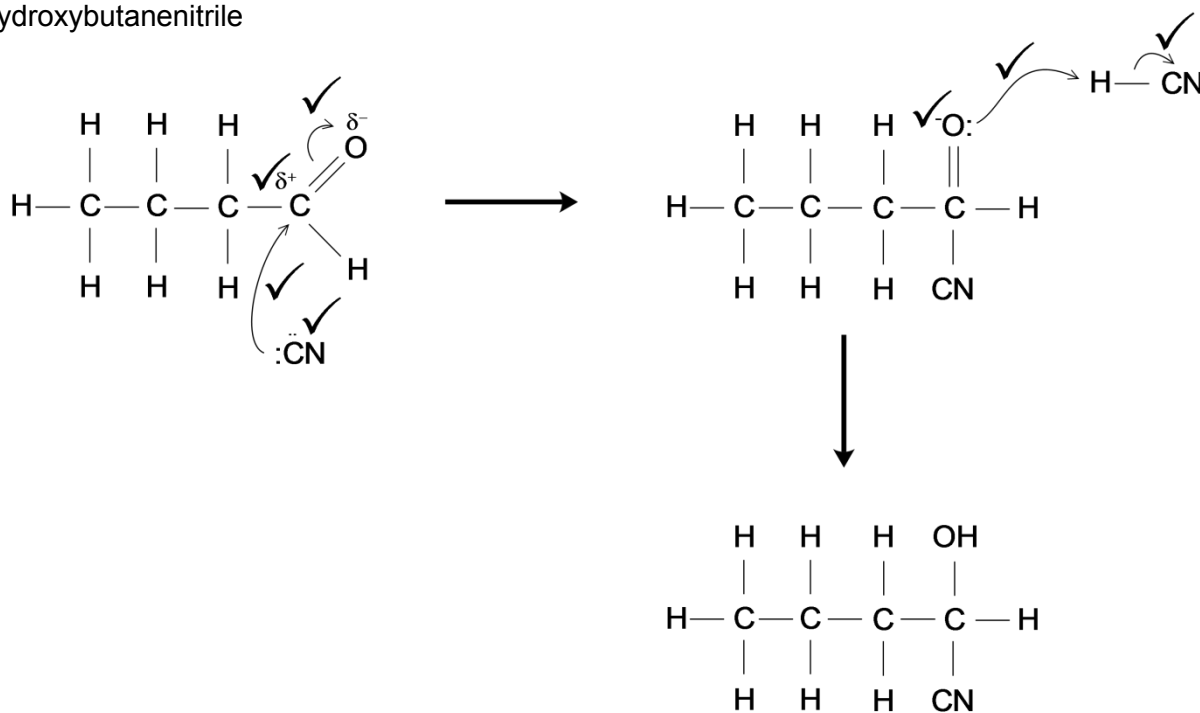
3. 1-Hydroxybutanenitrile

Task 3 Reviewing a mechanism



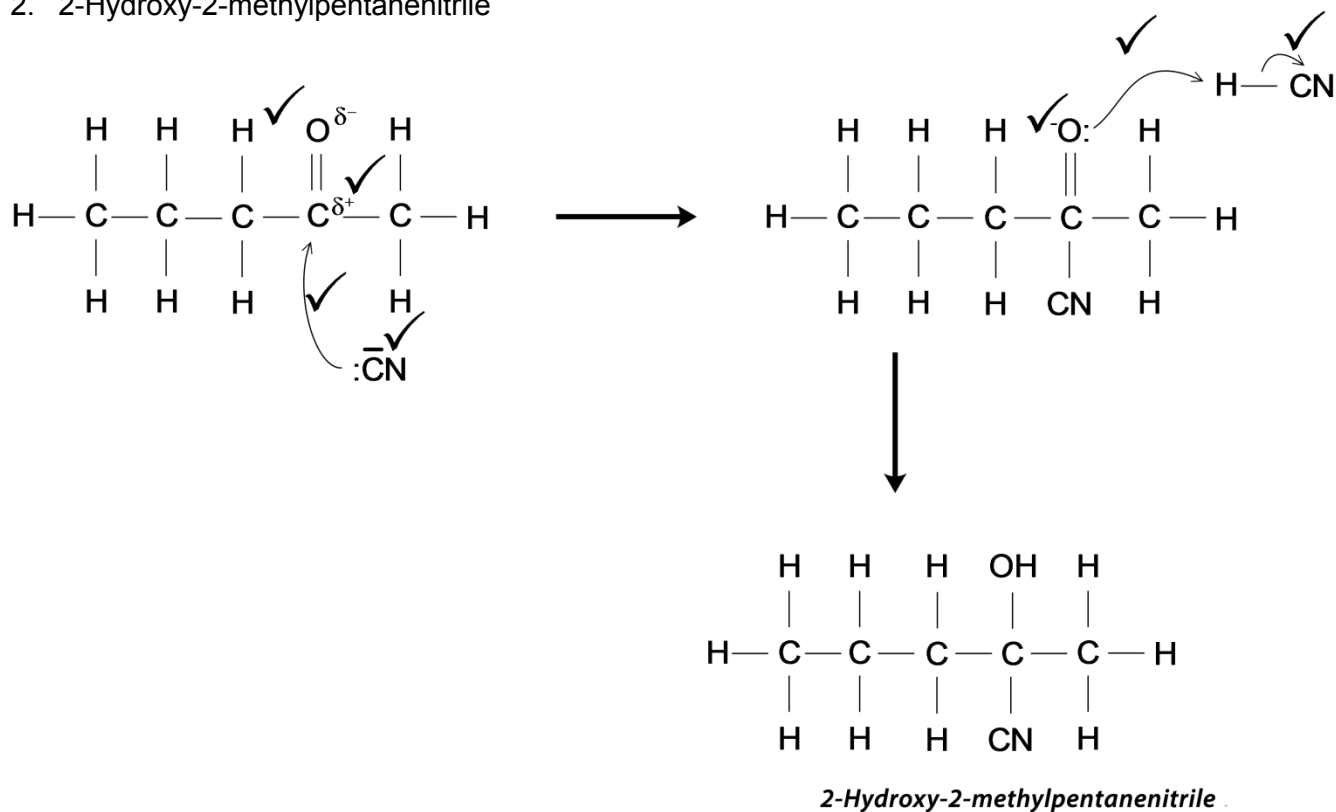
Task 4 Questions

1. 1-Hydroxybutanenitrile

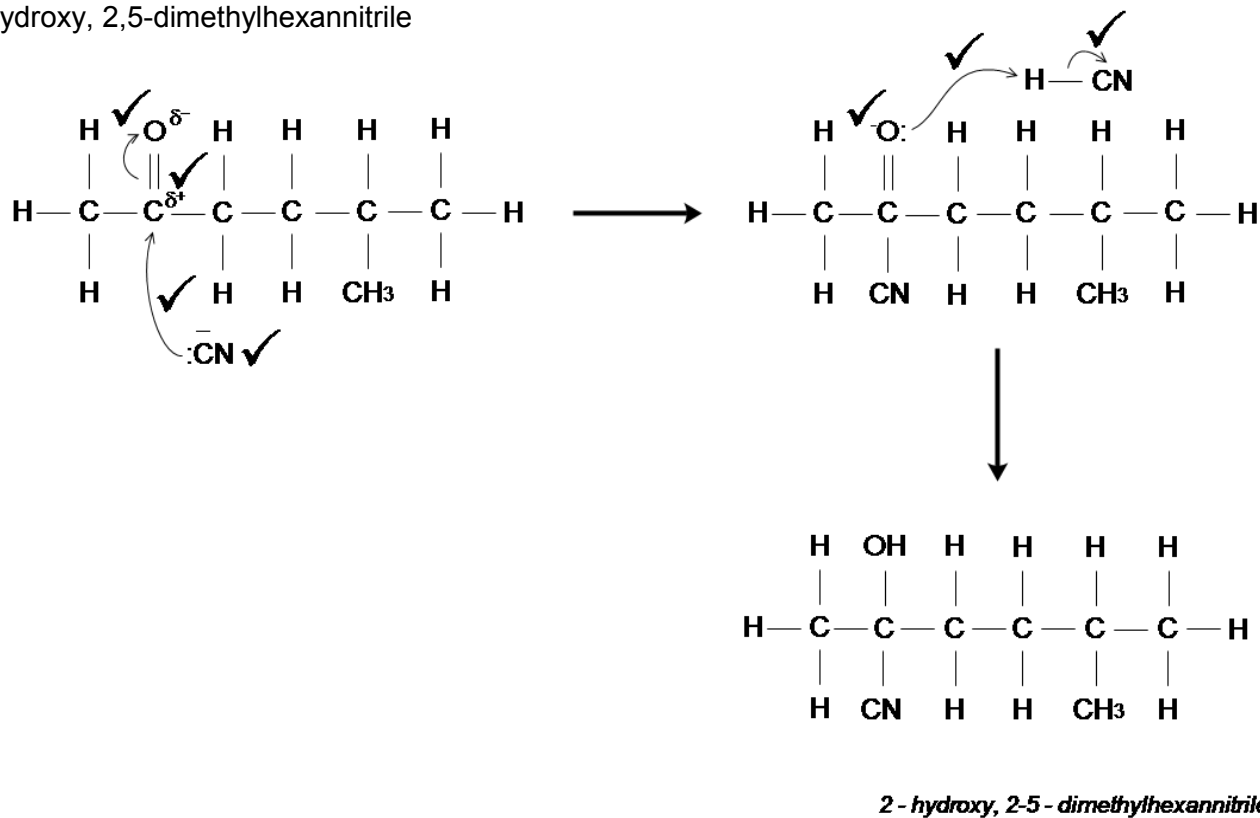


1-Hydroxybutanenitrile

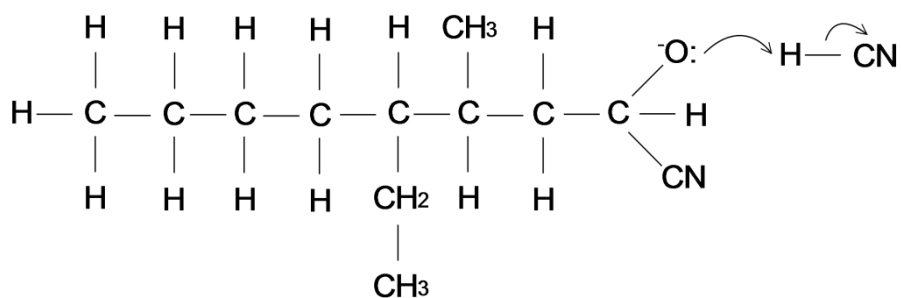
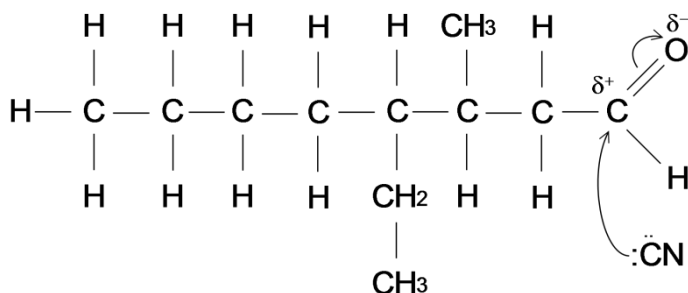
2. 2-Hydroxy-2-methylpentanenitrile



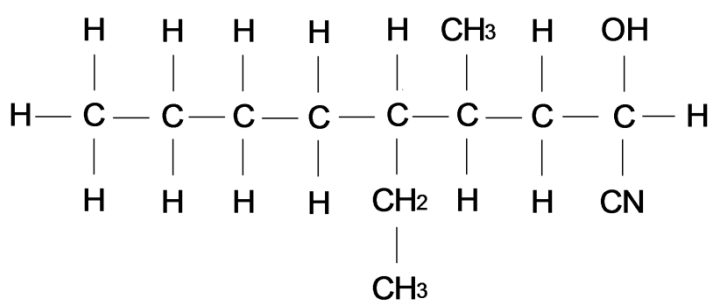
3. 2-Hydroxy, 2,5-dimethylhexannitrile



4. 5-Ethyl-2-hydroxy-4-methylnonanenitrile



5-Ethyl-2-hydroxy-4-methylnonanenitrile





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