

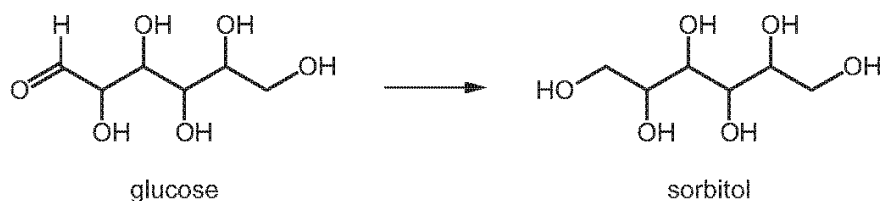
1628 - (9701-W 2017-Paper 1/3-Q24) - ORGANIC SYNTHESIS

Which organic reaction is an example of nucleophilic substitution?

- A $\text{CH}_3\text{CH}_2\text{Br} + \text{NaOH} \rightarrow \text{CH}_2\text{CH}_2 + \text{H}_2\text{O} + \text{NaBr}$
 B $\text{CH}_3\text{CH}_2\text{Br} + \text{NaOH} \rightarrow \text{CH}_3\text{CH}_2\text{OH} + \text{NaBr}$
 C $\text{CH}_2\text{CH}_2 + \text{HCl} \rightarrow \text{C}_2\text{H}_5\text{Cl}$
 D $\text{C}_2\text{H}_6 + \text{Cl}_2 \rightarrow \text{C}_2\text{H}_5\text{Cl} + \text{HCl}$

1629 - (9701-W 2017-Paper 1/1-Q26) - ORGANIC SYNTHESIS

Glucose can be used to prepare sorbitol, a compound used as a sugar substitute.



Which reagent may be used for this conversion?

- A acidified potassium dichromate(VI)
 B sodium borohydride
 C sodium hydroxide
 D Tollens' reagent

1630 - (9701-W 2017-Paper 1/1-Q29) - ORGANIC SYNTHESIS

Ethene is reacted with steam in the presence of concentrated H_3PO_4 . The product of this reaction is added to acidified potassium dichromate(VI) and heated under reflux for one hour. The final organic product is collected and labelled X.

But-2-ene is treated with hot, concentrated, acidified potassium manganate(VII). The final organic product is collected and labelled Y.

Which statement is correct?

- A One molecule of X has more carbon atoms than one molecule of Y.
 B One molecule of Y has more carbon atoms than one molecule of X.
 C X and Y have different functional groups.
 D X is the same compound as Y.

1631 - (9701-W 2017-Paper 1/2-Q36) - ORGANIC SYNTHESIS

Modern cars are fitted with catalytic converters to reduce atmospheric pollution caused by unwanted reactions during the combustion of the fuel.

Which statements are correct?

- 1 Carbon monoxide is oxidised to carbon dioxide in a catalytic converter.
- 2 Catalytic converters have a very large surface area.
- 3 Nitrogen dioxide is reduced to nitrogen monoxide in a catalytic converter.

1632 - (9701-W 2017-Paper 1/2-Q37) - ORGANIC SYNTHESIS

Which statements are correct for an S_N2 mechanism?

- 1 One bond is being broken at the same time as another bond is being formed.
- 2 The formation of the intermediate involves the collision of two molecules or ions.
- 3 A carbon atom in the transition state is bonded, either fully or partially, to five atoms.

1633 - (9701-W 2017-Paper 1/2-Q38) - ORGANIC SYNTHESIS

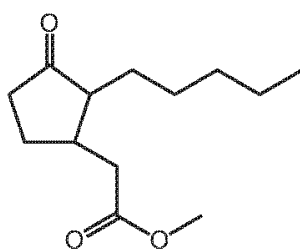
Bromoethane is heated under reflux with concentrated aqueous NaOH.

Which statements are correct?

- 1 The major product is a primary alcohol.
- 2 The major reaction is hydrolysis by an S_N2 mechanism.
- 3 The major product would be the same if the NaOH is dissolved in ethanol.

1634 - (9701-W 2017-Paper 1/2-Q39) - ORGANIC SYNTHESIS

Compound M is an important ingredient in perfume.



compound M

M reacts with HCN.

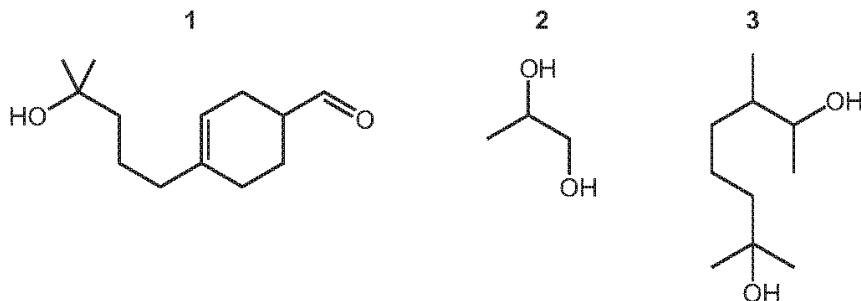
Which statements about this reaction are correct?

- 1 A small amount of NaOH will speed up the reaction.
- 2 The reaction is initiated by the transfer of a proton to one of the C=O groups.
- 3 Both of the C=O groups react with HCN.

1635 - (9701-W 2017-Paper 1/3-Q39) - ORGANIC SYNTHESIS

The compounds below are used to make perfumes.

Which compounds will produce a yellow precipitate with alkaline aqueous iodine?



1636 - (9701-W 2017-Paper 1/1-Q40) - ORGANIC SYNTHESIS

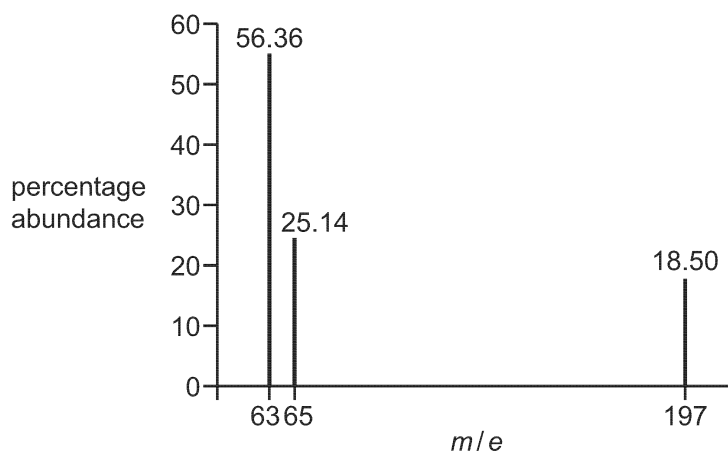
The reaction of ethanal, CH_3CHO , with HCN to form 2-hydroxypropanenitrile is catalysed by NaCN .

What are features of the intermediate of this reaction?

- 1 It is chiral.
- 2 It has a single negative charge on one of its atoms.
- 3 It is a nucleophile.

1637 - (9701-S 2019-Paper 1/3-Q2) - ORGANIC SYNTHESIS

The mass spectrum of an alloy of copper and gold is shown.



Which expression can be used to calculate the relative atomic mass, A_r , of copper present in this sample?

- A** $\frac{(56.36 \times 63) + (25.14 \times 65)}{(56.36 + 25.14 + 18.50)}$
- B** $\frac{(56.36 \times 63) + (25.14 \times 65) + (18.50 \times 197)}{(56.36 + 25.14 + 18.50)}$
- C** $\frac{(56.36 \times 63) + (25.14 \times 65)}{(56.36 + 25.14)}$
- D** $\frac{(56.36 \times 63) + (25.14 \times 65)}{(63 + 65)}$

1638 - (9701-W 2019-Paper 1/2-Q39) - ORGANIC SYNTHESIS

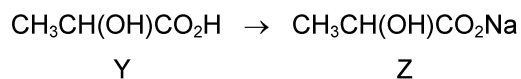
The responses **A** to **D** should be selected on the basis of

A	B	C	D
1, 2 and 3 are correct	1 and 2 only are correct	2 and 3 only are correct	1 only is correct

No other combination of statements is used as a correct response.

Use of the Data Booklet may be appropriate for some questions.

Which reagents, when used in excess, can convert Y into Z?



- 1 Na
- 2 Na_2CO_3
- 3 NaOH

1639 - (9701-W 2019-Paper 1/2-Q40) - ORGANIC SYNTHESIS

The responses **A** to **D** should be selected on the basis of

A	B	C	D
1, 2 and 3 are correct	1 and 2 only are correct	2 and 3 only are correct	1 only is correct

No other combination of statements is used as a correct response.

Use of the Data Booklet may be appropriate for some questions.

Each of the compounds below is treated separately with an excess of NaBH_4 .

The product of each reaction is then heated with an excess of concentrated H_2SO_4 .

Which compounds give **only one** final product with the molecular formula C_7H_{10} ?

