



CHEMISTRY ONLINE
— **TUITION** —

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CHEMISTRY

ORGANIC CHEMISTRY

Level & Board	AQA (A-LEVEL)
TOPIC:	ALCOHOLS
PAPER TYPE:	SOLUTION - 1
TOTAL QUESTIONS	10
TOTAL MARKS	24

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Alcohols - 1

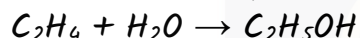
1.

(a)

Hydration refers to the addition of water molecules to a compound.

In the manufacturing of ethanol through the direct hydration of ethene, this process involves the addition of water (H_2O) to ethene (C_2H_4) to form ethanol (C_2H_5OH).

The chemical equation for this reaction is:



(1)

(b)

Advantage:

Renewable Feedstock:

Ethanol production by fermentation utilizes renewable feedstocks, such as sugars from crops, contributing to sustainable and green practices.

Disadvantage:

Slow Processing:

Fermentation is a slow process, impacting the overall efficiency and speed of ethanol production.

(3)

2. c

(1)

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3.

(a)

Type of reaction:

Substitution / Hydrolysis

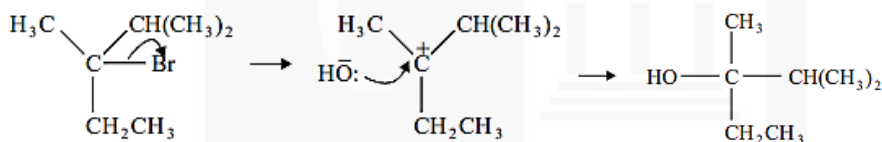
Role of reagent:

Nucleophile

(1)

(b)

Mechanism:



(3)

4. B

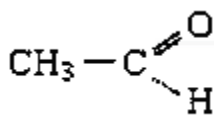
(1)

5.

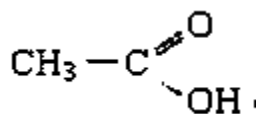
(a)

Ethanol can be oxidised to an aldehyde and to a carboxylic acid following are the structures of these products

Structure of aldehyde:

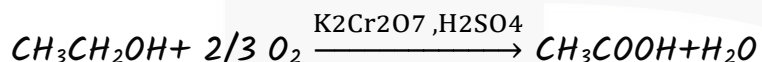


Structure of carboxylic acid:



(2)

(b)

*Reagent: Sodium / (potassium) dichromate (VI)**Conditions:**Acidified or sulfuric acid can be used.**The reaction is often performed with the addition of heat under reflux.**Reagents can be employed under these conditions.*

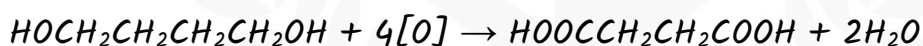
(3)

6. D

(1)

7.

Butane-1,4-diol belongs to primary alcohols. In butane-1,4-diol, each carbon to which the hydroxyl groups are attached is a primary carbon, as they are each bonded to only one other carbon atom.

*Reagent: acidified potassium (H_2SO_4 / $\text{K}_2\text{Cr}_2\text{O}_7$)**Equation:*

(3)

8. D

(1)

9.

*Separate samples of propanone and propanal by test using:**Test Reagent:**Tollens' reagent (ammoniacal silver nitrate solution)**Observation with Propanone (Propan-2-one):*

Propanone does not give a positive reaction with Tollens' reagent. It does not reduce the silver ions in the reagent, so no silver mirror or precipitate is formed.

Observation with Propanal (Propanaldehyde):

Propanal reacts with Tollens' reagent.

The aldehyde group in propanal is oxidized to a carboxylic acid, and silver ions in the Tollens' reagent are reduced to metallic silver.

This results in the formation of a silver mirror on the inner surface of the test tube or container, indicating the presence of an aldehyde functional group.

(4)

10. D

(1)



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- Founder & CEO of Chemistry Online Tuition Ltd.
- Completed Medicine (M.B.B.S) in 2007
- Tutoring students in UK and worldwide since 2008
- CIE & EDEXCEL Examiner since 2015
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