



A-Level Chemistry
Aldehydes and Ketones
(Multiple Choice)
Question Paper

Time available: 18 minutes
Marks available: 18 marks

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1.

How many structural isomers with the molecular formula $C_5H_{10}O$ react with Tollens' reagent?

- A 3
- B 4
- C 5
- D 6

(Total 1 mark)

2.

Which alcohol could **not** be produced by the reduction of an aldehyde or a ketone?

- A 2,2-dimethylpropan-1-ol
- B 2-methylbutan-2-ol
- C 3-methylbutan-2-ol
- D pentan-3-ol

(Total 1 mark)

3.

Which alcohol could **not** be produced by the reduction of an aldehyde or a ketone?

- A 2-methylbutan-1-ol
- B 2-methylbutan-2-ol
- C 3-methylbutan-1-ol
- D 3-methylbutan-2-ol

(Total 1 mark)

4.

Which one of the following reactions will produce an organic compound that has optical isomers?

- A dehydration of butan-2-ol by heating with concentrated sulphuric acid
- B reduction of pentan-3-one by warming with $NaBH_4$
- C addition of Br_2 to 3-bromopropene
- D reduction of 2,3-dimethylpent-2-ene with H_2 in the presence of a nickel catalyst

(Total 1 mark)

5. In which one of the following mixtures does a redox reaction occur?

- A ethanal and Tollens' reagent
- B ethanoyl chloride and ethanol
- C ethanal and hydrogen cyanide
- D ethanoic acid and sodium hydroxide

(Total 1 mark)

6. Propanone can be reduced to form an alcohol. A functional group isomer of the alcohol formed is

- A $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$
- B $\text{CH}_3\text{CH}_2\text{CHO}$
- C $\text{CH}_3\text{OCH}_2\text{CH}_3$
- D CH_3COCH_3

(Total 1 mark)

7. Which one of the following is **not** a correct general formula for the non-cyclic compounds listed?

- A alcohols $\text{C}_n\text{H}_{2n+2}\text{O}$
- B aldehydes $\text{C}_n\text{H}_{2n+1}\text{O}$
- C esters $\text{C}_n\text{H}_{2n}\text{O}_2$
- D primary amines $\text{C}_n\text{H}_{2n+3}\text{N}$

(Total 1 mark)

8. Which one of the following would **not** reduce an acidified aqueous solution of potassium dichromate(VI)?

- A CH_3COOH
- B Zn
- C CH_3CHO
- D $\text{Fe}^{2+}(\text{aq})$

(Total 1 mark)

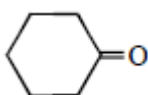
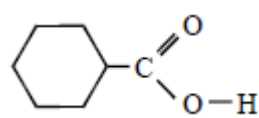
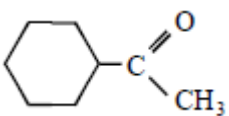
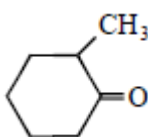
9. Which one of the following statements about but-2-enal, $\text{CH}_3\text{CH}=\text{CHCHO}$, is **not** true?

- A It has stereoisomers.
- B It shows a strong absorption in the infra-red at about 1700 cm^{-1} .
- C It will turn an acidified solution of potassium dichromate(VI) green.
- D It can be dehydrated by concentrated sulphuric acid.

(Total 1 mark)

10. The compound lithium tetrahydridoaluminate(III), LiAlH_4 , is a useful reducing agent. It behaves in a similar fashion to NaBH_4 . Carbonyl compounds and carboxylic acids are reduced to alcohols. However, LiAlH_4 also reduces water in a violent reaction so that it must be used in an organic solvent.

Which one of the following can be reduced by LiAlH_4 to a primary alcohol?

- A 
- B 
- C 
- D 

(Total 1 mark)

11. Which one of the following conversions does **not** represent a reduction?

- A propene \rightarrow propane
- B propanal \rightarrow propan-1-ol
- C propanal \rightarrow propanoic acid
- D propanone \rightarrow propane

(Total 1 mark)

12. Which one of the following reactions involves nucleophilic addition?

- A $\text{CH}_3\text{CH}=\text{CH}_2 + \text{HBr} \rightarrow \text{CH}_3\text{CHBrCH}_3$
- B $\text{CH}_3\text{CH}_2\text{CH}_3 + \text{Cl}_2 \rightarrow \text{CH}_3\text{CHClCH}_3 + \text{HCl}$
- C $\text{CH}_3\text{CH}_2\text{CH}_2\text{Br} + \text{NaOH} \rightarrow \text{CH}_3\text{CH}_2\text{CH}_2\text{OH} + \text{NaBr}$
- D $\text{CH}_3\text{CH}_2\text{CHO} + \text{HCN} \rightarrow \text{CH}_3\text{CH}_2\text{CH}(\text{OH})\text{CN}$

(Total 1 mark)

13. Which one of the following is **not** a suitable method for the preparation of ethanol?

- A oxidation of ethane
- B hydration of ethene
- C reduction of ethanal
- D hydrolysis of bromoethane

(Total 1 mark)

14. Which one of the following does **not** represent an oxidation?

- A propene \rightarrow propane
- B propan-1-ol \rightarrow propanal
- C propan-1-ol \rightarrow propanoic acid
- D propanal \rightarrow propanoic acid

(Total 1 mark)

15. CH_2O is the empirical formula of

- A methanol
- B methyl methanoate
- C ethane-1,2-diol
- D butanal

(Total 1 mark)

16. Which one of the following isomers is not oxidised under mild reaction conditions?

- A $(\text{CH}_3)_2\text{CHCH}(\text{OH})\text{COCH}_3$
- B $(\text{CH}_3)_2\text{C}(\text{OH})\text{CH}_2\text{COCH}_3$
- C $(\text{CH}_3)_2\text{CHCH}(\text{OH})\text{CH}_2\text{CHO}$
- D $(\text{CH}_3)_2\text{C}(\text{OH})\text{CH}_2\text{CH}_2\text{CHO}$

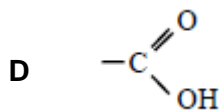
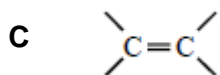
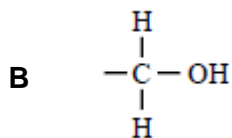
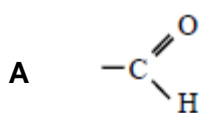
(Total 1 mark)

17.

Certain chemical tests were performed on the pain-relief drug ibuprofen. The results of these tests are given in the table below.

Test	Result
Aqueous sodium carbonate	Effervescence
Bromine water	Remained orange
Acidified potassium dichromate(VI) and heat	Remained orange
Fehling's solution and heat	Remained blue

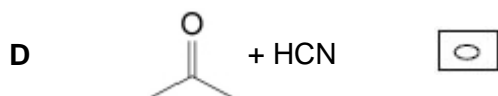
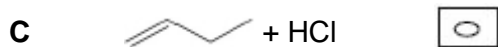
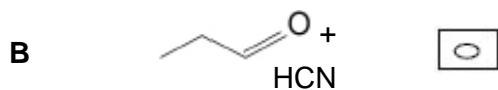
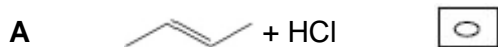
Which one of the following functional groups do these results suggest that ibuprofen contains?



(Total 1 mark)

18.

Which pair of compounds does **not** form a racemic mixture when the compounds react?



(Total 1 mark)