



A-Level Chemistry

Alcohol

(Multiple Choice)

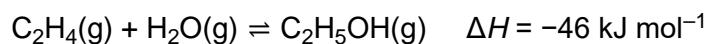
Question Paper

Time available: 30 minutes

Marks available: 30 marks

www.accesstuition.com

1. Which statement is **not** correct about the industrial production of ethanol from ethene at 300 °C?



- A The reaction is catalysed by an acid.
- B The reaction has 100% atom economy.
- C An increase in temperature decreases the equilibrium yield of ethanol.
- D An increase in pressure increases the value of K_c .

(Total 1 mark)

2. Which compound is produced when 1-phenylethanol reacts with acidified potassium dichromate(VI)?

- A $\text{C}_6\text{H}_5\text{CH}_2\text{CH}_2\text{OH}$
- B $\text{C}_6\text{H}_5\text{CH}_2\text{CHO}$
- C $\text{C}_6\text{H}_5\text{COCH}_3$
- D $\text{C}_6\text{H}_5\text{CH}(\text{OH})\text{CH}_3$

(Total 1 mark)

3. Which statement is correct about the production and use of ethanol as a biofuel?

- A Biofuel ethanol is produced by the fermentation of glucose in the presence of yeast and air.
- B Biofuel ethanol is purified by fractional distillation.
- C No carbon dioxide is released when biofuel ethanol is burned.
- D Biofuel ethanol burns with a cleaner flame than ethanol made by hydration of ethene.

(Total 1 mark)

4. Which compound reacts to form a ketone when warmed with an acidified solution of potassium dichromate(VI)?

A $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$

B $(\text{CH}_3)_2\text{CHOH}$

C $\text{CH}_3\text{CH}_2\text{CHO}$

D $(\text{CH}_3)_2\text{CHCOOH}$

(Total 1 mark)

5. Which compound can be oxidised to form $(\text{CH}_3)_2\text{CHCOCH}_3$?

A 2-methylpropan-1-ol

B 2,2-dimethylpropanol

C 2-methylbutan-2-ol

D 3-methylbutan-2-ol

(Total 1 mark)

6. Which alcohol forms a mixture of alkenes when dehydrated?

A propan-1-ol

B propan-2-ol

C pentan-1-ol

D pentan-2-ol

(Total 1 mark)

7. Which compound is formed when 1-phenylethanol reacts with acidified potassium dichromate(VI)?

A $C_6H_5CH_2CH_2OH$

B $C_6H_5CH_2CHO$

C $C_6H_5COCH_3$

D $C_6H_5CH_2COOH$

(Total 1 mark)

8. In the UK industrial ethanol is now produced by the direct hydration of ethene. This process has largely replaced the fermentation method.

Which is a likely reason for this change of method?

A The direct hydration route produces purer ethanol.

B The direct hydration route employs milder conditions.

C The direct hydration route does NOT use a catalyst.

D The direct hydration route produces ethanol by a slower reaction.

(Total 1 mark)

9. Which statement is correct about both 2-methylbutan-1-ol and 2-methylbutan-2-ol?

A They can be formed by alkaline hydrolysis of esters.

B They can be oxidised by reaction with acidified potassium dichromate(VI).

C They can be formed by hydration of 2-methylbut-2-ene.

D They have four peaks in their ^{13}C NMR spectra.

(Total 1 mark)

10.

Which alcohol can be oxidised by acidified potassium dichromate(VI) but cannot be dehydrated by heating with concentrated sulfuric acid?

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

(Total 1 mark)

11.

Which statement about ethanal is correct?

- A It reacts with Tollens' reagent to form silver.
- B It has a higher boiling point than ethanol.
- C Its empirical and molecular formulas are different.
- D It belongs to a homologous series with general formula $C_nH_{2n+1}O$

(Total 1 mark)

12.

Propene can be made by the dehydration of propan-2-ol.

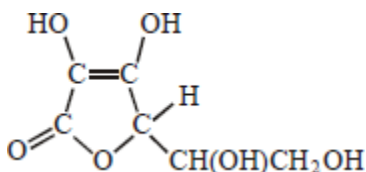
What is the percentage yield when 30 g of propene ($M_r = 42.0$) are formed from 50 g of propan-2-ol ($M_r = 60.0$)?

- A 60%
- B 67%
- C 81%
- D 86%

(Total 1 mark)

13.

Which one of the following is **not** a correct statement about vitamin C, shown below?



- A It is a cyclic ester.
- B It can form a carboxylic acid on oxidation.
- C It decolourises a solution of bromine in water.
- D It is a planar molecule.

(Total 1 mark)

14.

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)

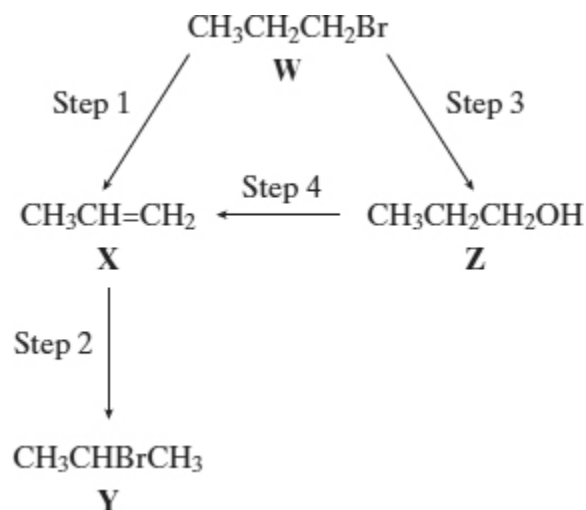
15.

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)

16. For this question refer to the reaction scheme below.



Which one of the following statements is **not** correct?

- A Reaction of **W** with sodium cyanide followed by hydrolysis of the resulting product gives propanoic acid.
- B Mild oxidation of **Z** produces a compound that reacts with Tollens' reagent, forming a silver mirror.
- C **Z** reacts with ethanoic acid to produce the ester propyl ethanoate.
- D **W** undergoes addition polymerisation to form poly(propene).

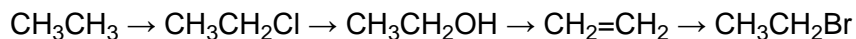
(Total 1 mark)

17. Which one of the following alcohols forms a mixture of alkenes when dehydrated?

- A propan-1-ol
- B propan-2-ol
- C pentan-1-ol
- D pentan-2-ol

(Total 1 mark)

18. Which one of the following mechanisms is **not** involved in the reaction sequence below?



- A electrophilic addition
- B electrophilic substitution
- C nucleophilic substitution
- D free-radical substitution

(Total 1 mark)

19.

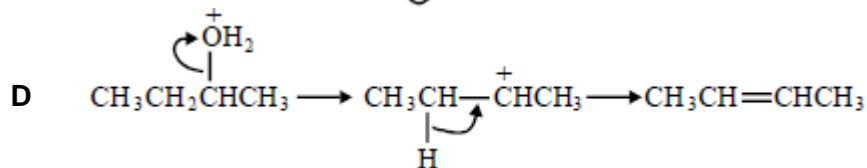
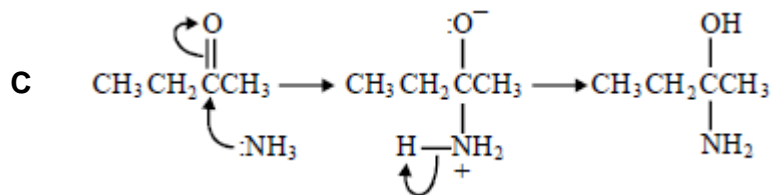
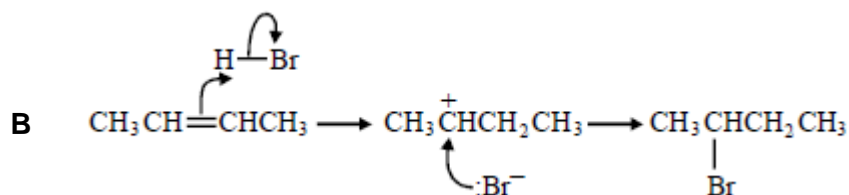
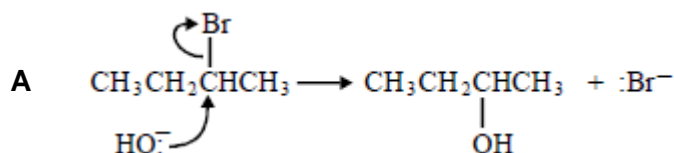
Which one of the following isomers is not oxidised under mild reaction conditions?

- 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)

20.

In which of the following is a curly arrow used incorrectly?



(Total 1 mark)

21.

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)

22. Which pair of reagents does **not** produce ethanol?

- A $\text{CH}_3\text{CH}_2\text{Br}$ and $\text{NaOH}(\text{aq})$
- B $\text{CH}_3\text{COOCH}_3$ and $\text{NaOH}(\text{aq})$
- C $\text{HCOOCH}_2\text{CH}_3$ and $\text{NaOH}(\text{aq})$
- D CH_3CHO and $\text{NaBH}_4(\text{aq})$

(Total 1 mark)

23. Which compound can be dehydrated to form an alkene?

- A CH_3CHO
- B CH_3COOH
- C $\text{CH}_3\text{CH}_2\text{OH}$
- D $\text{CH}_3\text{COOCH}_3$

(Total 1 mark)

24. Which statement is **not** correct for both primary and secondary alcohols?

- A They are easily oxidised to carboxylic acids by acidified $\text{K}_2\text{Cr}_2\text{O}_7$ solution.
- B They can be formed from bromoalkanes by hydrolysis.
- C They form esters with carboxylic acids.
- D They show hydrogen bonding in the liquid state.

(Total 1 mark)

25. Which compound produces $(\text{CH}_3)_2\text{CHCOCH}_3$ when oxidised?

- A 2-methylpropan-1-ol
- B 2,2-dimethylpropanol
- C 2-methylbutan-2-ol
- D 3-methylbutan-2-ol

(Total 1 mark)

26.

Which alcohol when dehydrated forms a mixture of alkenes?

A propan-1-ol

B propan-2-ol

C pentan-1-ol

D pentan-2-ol

(Total 1 mark)

27.

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)

28.

CH_2O is the empirical formula of

A methanol

B methyl methanoate

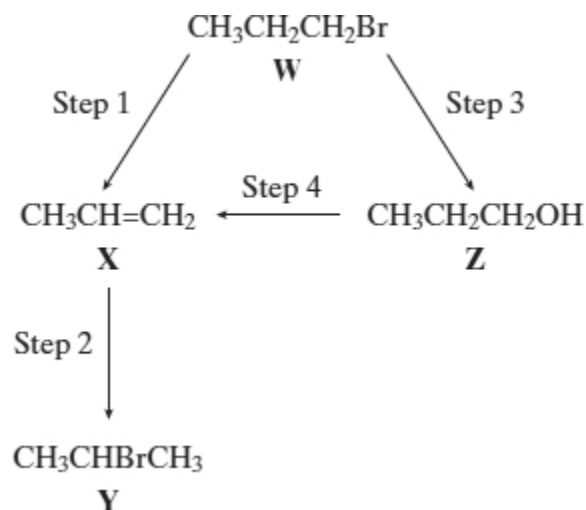
C ethane-1,2-diol

D butanal

(Total 1 mark)

29.

For this question refer to the reaction scheme below.



Which one of the following reagents would **not** bring about the reaction indicated?

- A Step 1 : alcoholic KOH
- B Step 2 : aqueous Br_2
- C Step 3 : aqueous NaOH
- D Step 4 : concentrated H_2SO_4

(Total 1 mark)

30.

Which one of the following **cannot** be produced by oxidation of propan-1-ol?

- A carbon dioxide
- B propanone
- C propanal
- D propanoic acid

(Total 1 mark)