O

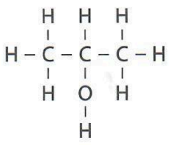
17 Alcohols and Carboxylic Acids

For each question, choose the most suitable option and write the letter (**A**, **B**, **C** or **D**) in the brackets provided.

Level 1

1. Which of the following structures does **not** represent that of an alcohol?

A



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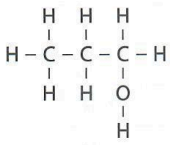

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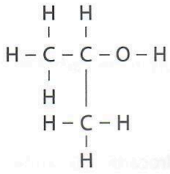

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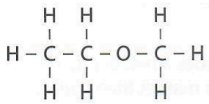

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2. Ethanol undergoes oxidation to form ethanoic acid.

   Which of the following regarding ethanol and ethanoic acid is **true**?

   A Ethanol contains one less carbon atom and two more hydrogen atoms as compared to ethanoic acid.

   B Ethanol contains one less oxygen atom and two more hydrogen atoms as compared to ethanoic acid.

   C Ethanol is unsaturated whereas ethanoic acid is saturated.

   D The molecular formula of ethanol does not change when it oxidises to ethanoic acid. ( )

3. Which of the following chemical formulae does **not** represent that of a carboxylic acid?

A CH_3COOH

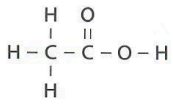
B $C_2H_4O_2$

C C_2H_5O

D $CH_3CH_2CO_2H$ ( )

4. Which of the following is the **correct** structure of ethanoic acid?

A



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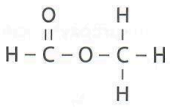

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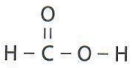

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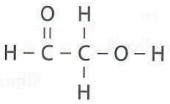

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5. A glass of wine tastes sour when left in air for a long time because _____.

A the alcohol in wine is converted into an alkene

B the oxygen in the air oxidises the ethanol in wine into vinegar

C the wine reacts with nitrogen in the air to form a compound that tastes sour

D the wine will decompose when left in air for a long time ( )

6. Which of the following reaction(s) involving an alcohol produce(s) carbon dioxide?

1 Burning propanol in oxygen

2 Converting glucose to ethanol

3 Oxidising ethanol to ethanoic acid

A 1 only

B 1 and 2 only

C 2 and 3 only

D All of the above ( )

Level 2

7. Which of the following will produce an observation when heated with ethanol?

   A Acidified potassium manganate(VII)

   B Aqueous bromine

   C Oxygen

   D Universal Indicator solution ( )

8. The structures of alcohol **A** and carboxylic acid **B** are shown in Figure 17.1.

Alcohol **A** Carboxylic acid **B**

Figure 17.1

   Which of the following is **true**?

   A Alcohol **A** can oxidise to form a compound that is in the same homologous series as carboxylic acid **B**.

   B Alcohol **A** reacts with ethane to form carboxylic acid **B**.

   C Carboxylic acid **B** can undergo cracking to form alcohol **A**.

   D Carboxylic acid **B** is formed when alcohol **A** is oxidised. ( )

9. Which of the following will **not** allow a student to distinguish between propanol and propanoic acid?

   A Acidified potassium manganate(VII)

   B Blue litmus paper

   C Red litmus paper

   D Sodium carbonate ( )

10. Which of the following is **true** about the fermentation of glucose?

   A Glucose can be obtained from animals.

   B The gas produced from the fermentation of glucose produces a white precipitate when bubbled into limewater.

   C The reaction can be carried out at a temperature of 80 °C to speed up the reaction.

   D Two different alcohols can be formed from the fermentation of glucose. ( )

Level 3

11. A carboxylic acid of the formula $C_{20}H_xCOOH$ is able to react with 3 mol of chlorine gas in the dark.

Which of the following is the **correct** molecular formula of the acid?

A $C_{20}H_{31}COOH$

B $C_{20}H_{35}COOH$

C $C_{20}H_{41}COOH$

D $C_{20}H_{47}COOH$

( )

12. The structure of compound **Q** is shown in Figure 17.2.

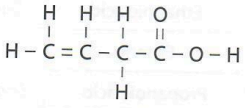


Figure 17.2

Which of the following statements is/are **true** of compound **Q**?

1 It can react with aqueous iodine.

2 It cannot react with magnesium carbonate.

3 It forms C_3H_7COOH when reacted with hydrogen gas.

4 It is an unsaturated carboxylic acid.

A 1 and 3 only

B 1, 3 and 4 only

C 2 only

D 2 and 4 only

( )

13. Study the reaction scheme in Figure 17.3.

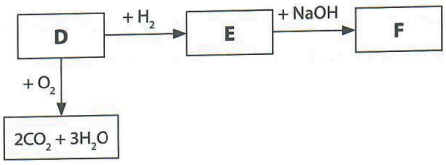


Figure 17.3

If substance **D** is an alcohol, what are the identities of substances **D** to **F**?

	D	E	F
A	Ethanol	Ethanoic acid	Sodium ethanoate
B	Ethanol	Ethene	Ethanol
C	Propanol	Propanoic acid	Sodium propanoate
D	Propanol	Propene	Propanol

( )

14. Which of the following statements are **true** about ethanol and propanol?

1 1 mol of propanol produces a greater volume of carbon dioxide during combustion compared to 1 mol of ethanol.

2 Both alcohols can be obtained by the fermentation of glucose in the presence of yeast.

3 Ethanol is a larger molecule than propanol.

4 The alcohols differ by a $-CH_2-$ unit.

A 1 and 2 only

B 1 and 4 only

C 2 and 4 only

D 3 and 4 only

( )

15. The structure of an alcohol is shown in Figure 17.4.

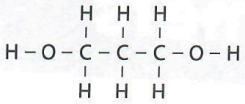
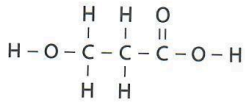


Figure 17.4

Which of the following shows the **correct** structure of the product when the alcohol is exposed to air for a long time?

A



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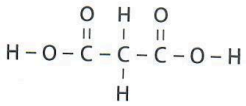

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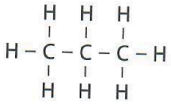

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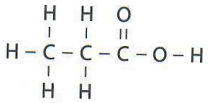

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