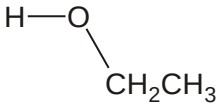
ALCOHOLS

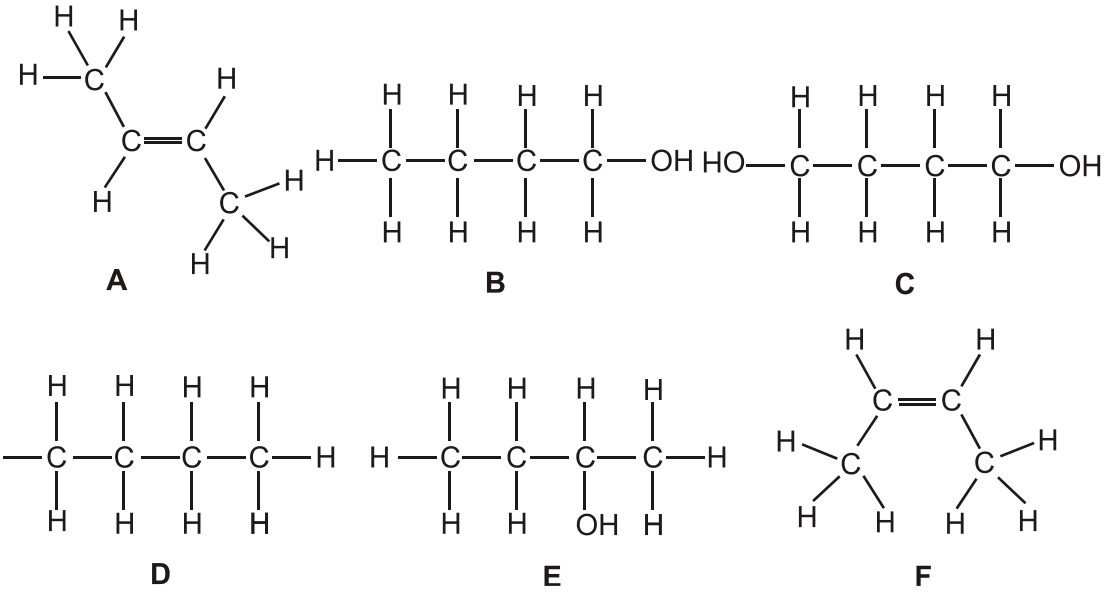
1. Ethanol has a relatively high boiling point. This can be explained in terms of intermolecular hydrogen bonds.

Draw a second molecule of ethanol alongside the one drawn below and show how a hydrogen bond could be formed. Clearly show any relevant dipoles and lone pairs of electrons.



[Total 3 marks]

2 This question is about the compounds **A-F** below.



(a) Answer the following questions by referring to the compounds **A-F**.

(i) What is the molecular formula of compound **D**?

.....

[1]

(ii) What is the empirical formula of compound **C**?

.....

[1]

(iii) Which two compounds are structural isomers of each other?

..... and .....

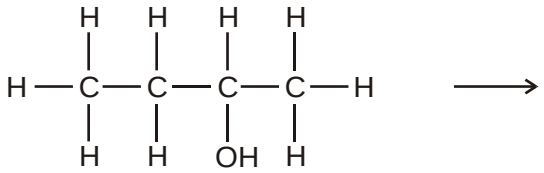
[1]

(iv) Which two compounds are *cis-trans* isomers of each other?

..... and .....

[1]

(b) Compound **E** can be dehydrated to form compound **A**. Complete a balanced equation for this reaction.



[1]

(c) Compound **C** can be dehydrated to form a new compound, **G**, with the molecular formula, C_4H_6. Suggest a structural formula and a name for **G**.

name: .....

structural formula:

[2]

[Total 7 marks]

3. Acrolein, CH_2==CHCHO, and acrylic acid, CH_2==CHCOOH, are both used in industry for the manufacture of plastic resins and polymers. Both acrolein and acrylic acid can be made from prop-2-en-1-ol, CH_2==$CHCH_2OH$.

(a) (i) Draw the structures of prop-2-en-1-ol and acrolein. Clearly display the functional groups in each compound.

prop-2-en-1-ol	**acrolein**

[2]

(ii) Name the functional group common to **both** prop-2-en-1-ol and acrolein.

.....

[1]

(b) Prop-2-en-1-ol can be oxidised to form either acrolein or acrylic acid.

(i) Identify a suitable oxidising mixture.

.....

[2]

(ii) Write a balanced equation for the oxidation of prop-2-en-1-ol into acrolein.

Use (O) to represent the oxidising agent.

.....

[1]

[Total 6 marks]

4. Cyclohexanol can also be oxidised to form cyclohexanone.

(i) State a suitable oxidising agent for this reaction.

.....

[1]

(ii) Write a balanced equation for the oxidation of cyclohexanol to cyclohexanone. Use [O] to represent the oxidising agent.

[1]

[Total 4 marks]