

AQA – Optical isomerism – A2 Chemistry P2

1. June/ 2019/Paper_2/No.6

0 6

This question is about isomers.

0 6 . 1

Give a reagent and observations for a test-tube reaction to distinguish between 2-methylbutan-1-ol and 2-methylbutan-2-ol.

[3 marks]

Reagent _____

Observation with 2-methylbutan-1-ol _____

Observation with 2-methylbutan-2-ol _____

0 6 . 2

Compounds **A** and **B** both have the molecular formula $C_4H_8Br_2$
A has a singlet, a triplet and a quartet in its 1H NMR spectrum.
B has only two singlets in its 1H NMR spectrum.

Draw a structure for each of **A** and **B**.**[2 marks]****A****B**

0 6 . 3

Compounds **C** and **D** both have the molecular formula $C_6H_3Br_3$

C has two peaks in its ^{13}C NMR spectrum.

D has four peaks in its ^{13}C NMR spectrum.

Draw a structure for each of **C** and **D**

[2 marks]

C

D

0 6 . 4 Compounds **E**, **F**, and **G** are isomers.

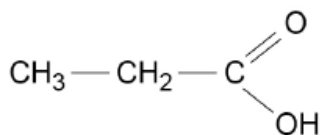
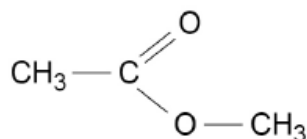
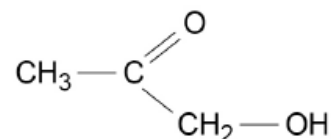
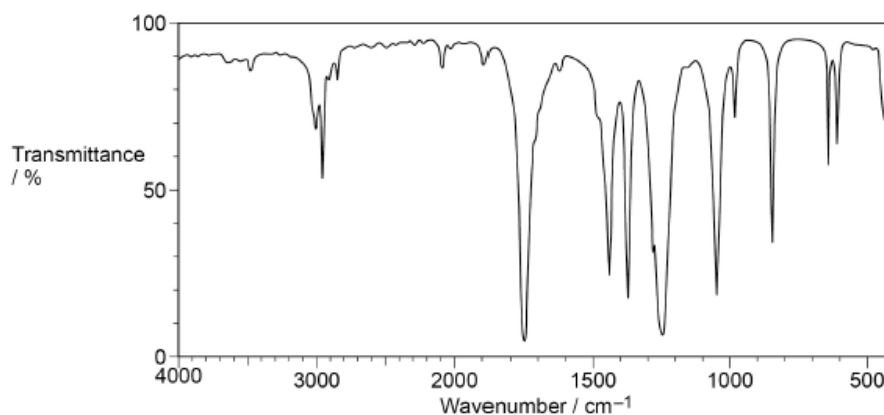
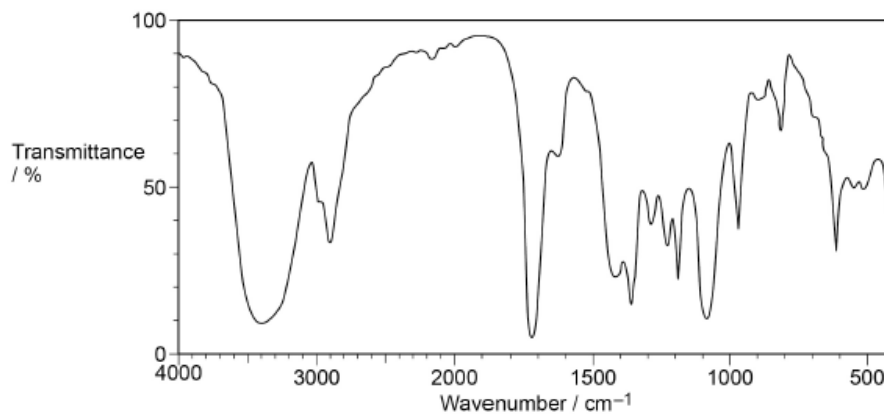
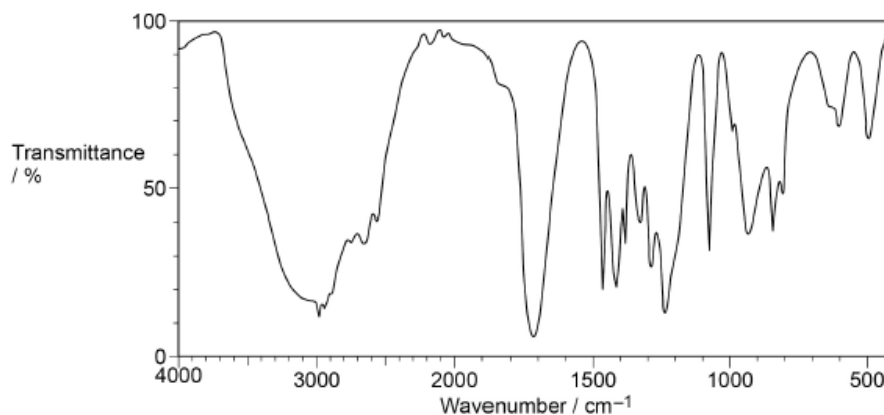
**E****F****G**

Figure 1 shows the infrared spectra of these isomers, but not necessarily in the same order.

Label each spectrum with the correct letter **E**, **F** or **G** in the box.

[1 mark]**Figure 1**





2. June/2021/Paper_2/No.6

0 6

This question is about isomers with the molecular formula $C_5H_{10}O$

0 6 . 1

Draw the skeletal formula of a branched chain aldehyde with molecular formula $C_5H_{10}O$ that is optically active.

[1 mark]

0 6 . 2

Describe how you distinguish between separate samples of the two enantiomers of the branched chain aldehyde $C_5H_{10}O$

[2 marks]

0 6 . 3

Draw the *E* and *Z* forms of a structural isomer of $C_5H_{10}O$ that shows both optical and geometric isomerism.

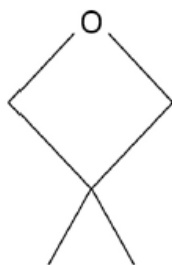
[2 marks]

<i>E</i> isomer	<i>Z</i> isomer

0 6 . 4

Isomer J is cyclic and has an ether functional group (C–O–C)
Isomer J has only three peaks in its ^{13}C NMR spectrum.

Isomer J



Draw **two** other cyclic isomers of $\text{C}_5\text{H}_{10}\text{O}$ that have an ether functional group and only three peaks in their ^{13}C NMR spectra.

[2 marks]