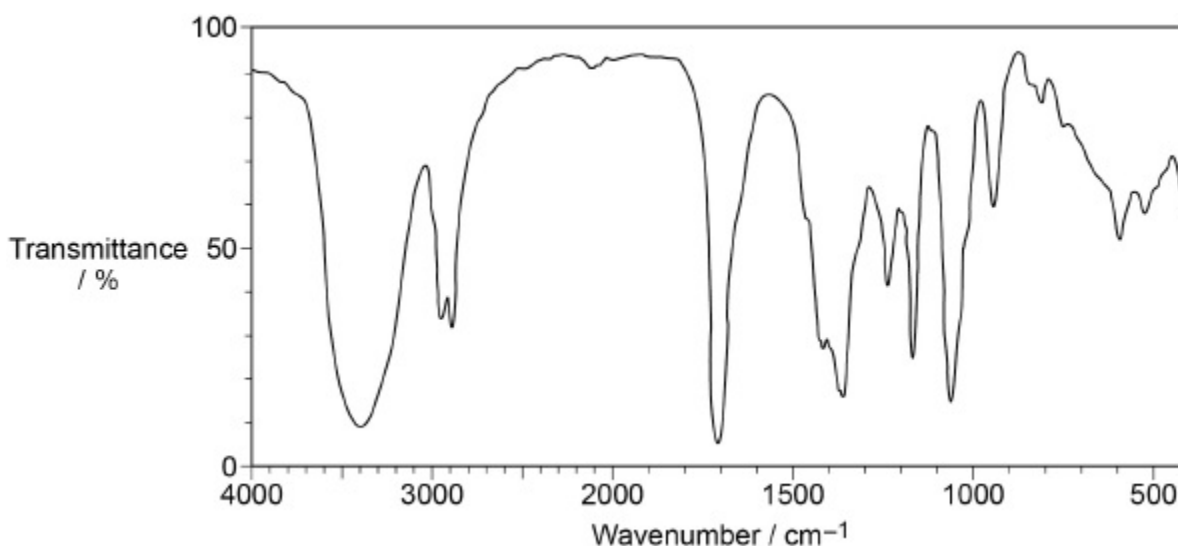


1.

The infrared spectrum of an organic compound is shown.



Which compound produces this spectrum?

A ethanoic acid

B 4-hydroxybutanone

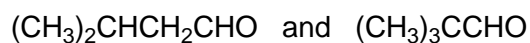
C propan-1-ol

D prop-2-en-1-ol

(Total 1 mark)

2.

Which can be used to distinguish between these two compounds?



A Acidified potassium dichromate(VI)

B Fingerprint region of infrared spectrum

C M_r value in high resolution mass spectrometry

D Tollens' reagent

(Total 1 mark)

3.

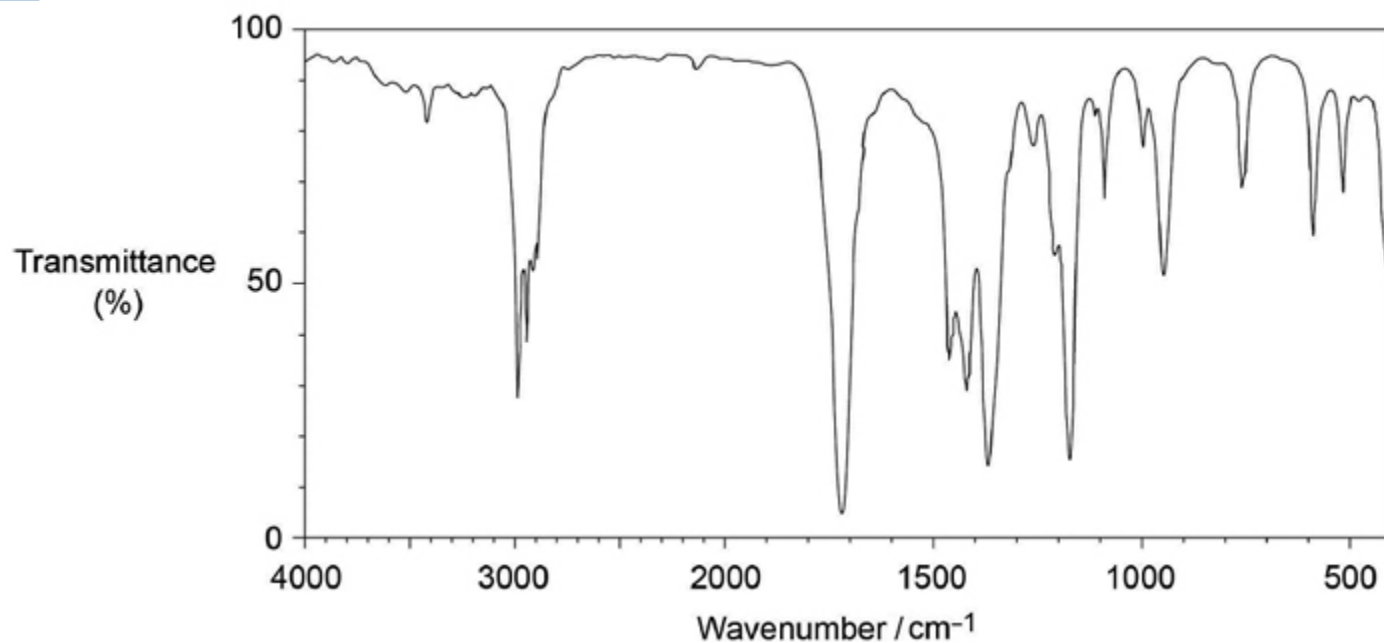
Three reagents are added separately to four organic compounds.

Which row shows the correct observations?

		Sodium hydrogen carbonate	Acidified potassium dichromate(VI)	Tollens' reagent	
A	Propan-1-ol	effervescence	orange solution turns green	no visible change	<input type="checkbox"/>
B	Propanal	no visible change	orange solution turns green	silver mirror	<input type="checkbox"/>
C	Propanone	no visible change	no visible change	silver mirror	<input type="checkbox"/>
D	Propanoic acid	effervescence	no visible change	silver mirror	<input type="checkbox"/>

(Total 1 mark)

4. The infrared spectrum of an organic compound is shown.



Which compound produces this spectrum?

- A butanone
- B ethanol
- C pent-2-ene
- D propanoic acid

(Total 1 mark)

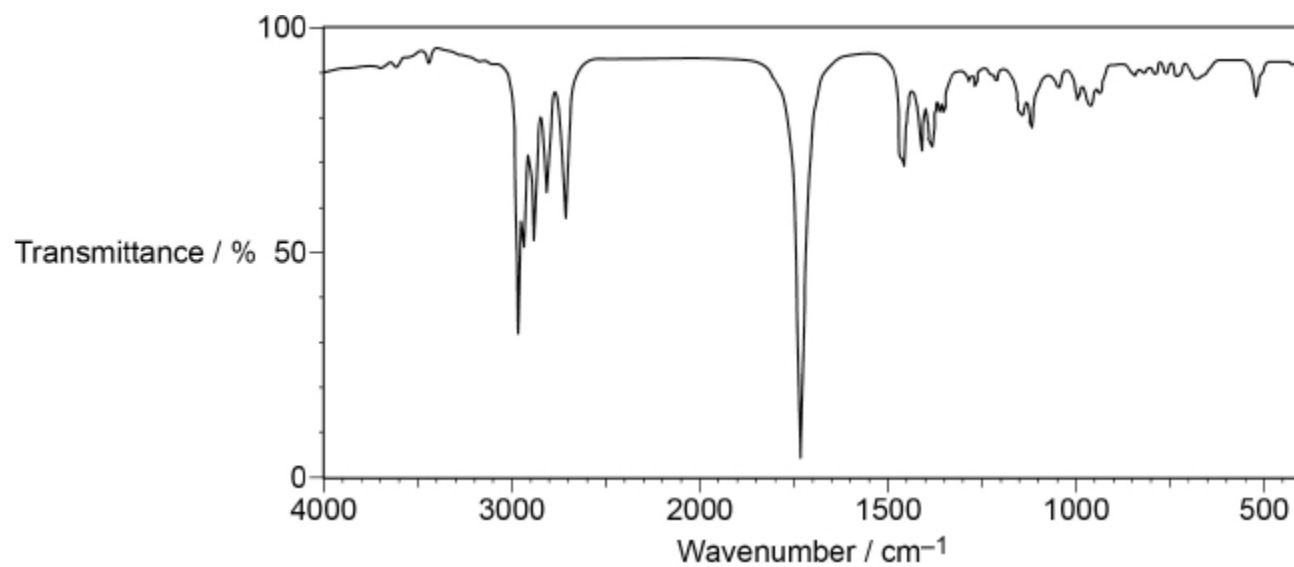
5. Which compound forms a molecular ion with a different precise molecular mass from the other three?

- A butanone
- B cyclobutanol
- C dimethylpropane
- D methylpropanal

(Total 1 mark)

6.

Which compound gives this infrared spectrum?

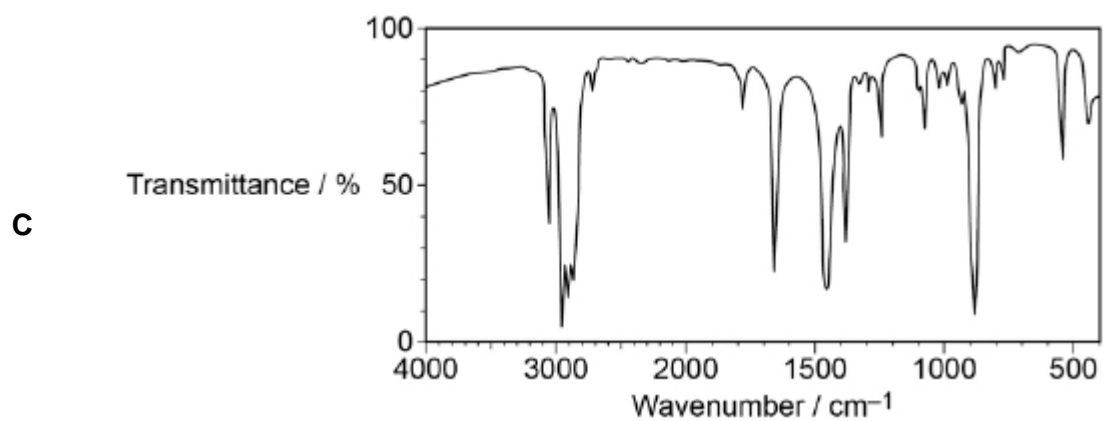
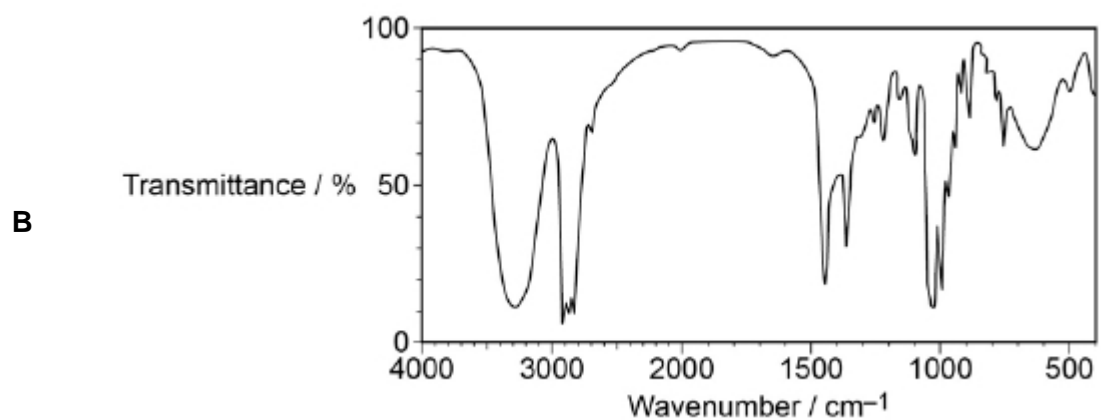
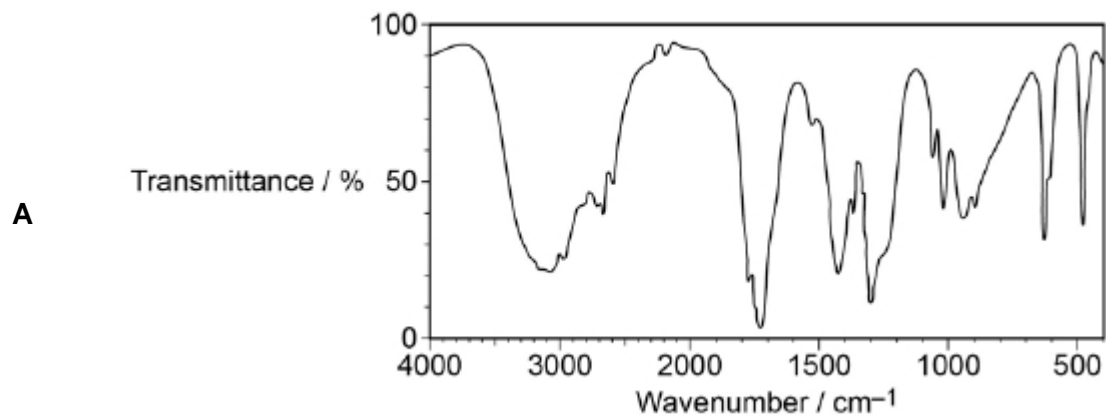


- A 1-bromobutane
- B butan-1-ol
- C butanal
- D butanoic acid

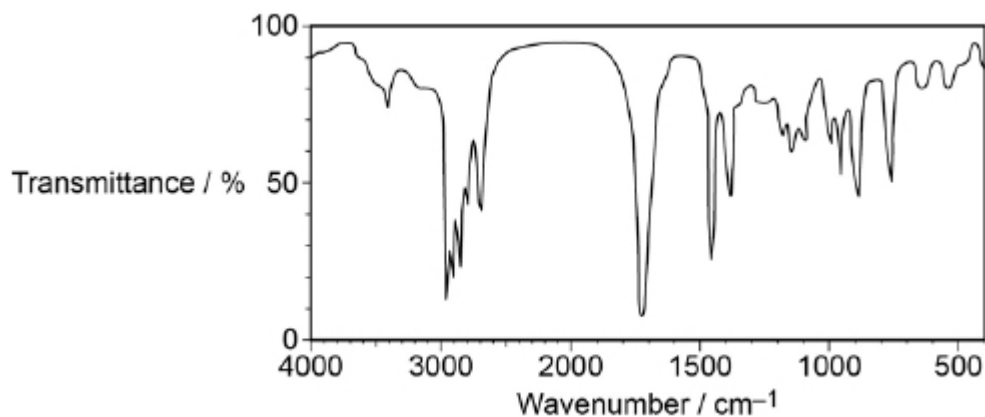
(Total 1 mark)

7.

Which of these infrared spectra could represent a carboxylic acid?



D



(Total 1 mark)

8.

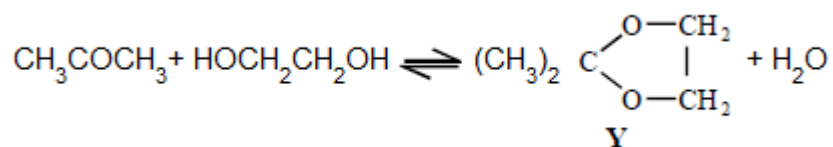
Which of the following compounds would form an orange-red precipitate when heated with Fehling's solution?

A $\text{CH}_3\text{CH}_2\text{CN}$ B $\text{CH}_3\text{CH}_2\text{COOH}$ C CH_3CHO D CH_3COCH_3 

(Total 1 mark)

9.

This question is about the reaction between propanone and an excess of ethane-1,2-diol, the equation for which is given below.



In a typical procedure, a mixture of 1.00 g of propanone, 5.00 g of ethane-1,2-diol and 0.100 g of benzenesulphonic acid, $\text{C}_6\text{H}_5\text{SO}_3\text{H}$, is heated under reflux in an inert solvent. Benzenesulphonic acid is a strong acid.

The products would **not** have an absorption in the infra-red at

A 1050 cm^{-1} B 1720 cm^{-1} C 2950 cm^{-1} D 3400 cm^{-1}

(Total 1 mark)

10.

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

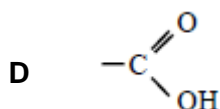
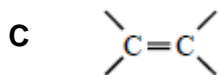
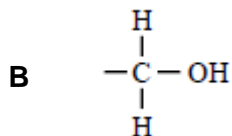
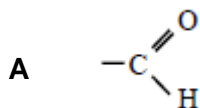
- A It has stereoisomers.
- B It shows a strong absorption in the infra-red at about 1700 cm^{-1} .
- C It will turn an acidified solution of potassium dichromate(VI) green.
- D It can be dehydrated by concentrated sulphuric acid.

(Total 1 mark)**11.**

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)**