



A-Level Chemistry

NMR

(Multiple Choice)

Question Paper

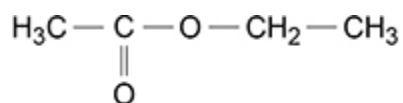
Time available: 11 minutes

Marks available: 11 marks

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1.

Which statement does **not** support the suggestion that an unknown organic compound is



- A Its ^1H NMR spectrum has 3 peaks with an integration ratio of 2:3:3
- B Its ^{13}C NMR spectrum has 3 peaks.
- C Its infrared spectrum has an absorption at 1735 cm^{-1}
- D It has 36.36% by mass of oxygen and 9.09% by mass of hydrogen.

(Total 1 mark)

2.

How many peaks are there in the ^{13}C NMR spectrum of 1,4-dimethylbenzene?

- A 8
- B 4
- C 3
- D 2

(Total 1 mark)

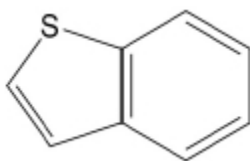
3.

Which amine has only **three** peaks in its proton NMR spectrum?

- A Methylamine
- B Trimethylamine
- C Diethylamine
- D Propylamine

(Total 1 mark)

4. How many peaks does this compound have in its ^{13}C spectrum?



- A 5
- B 6
- C 7
- D 8

(Total 1 mark)

5. How many peaks will be observed in the low-resolution proton n.m.r. spectrum of $(\text{CH}_3)_2\text{CHCOO}(\text{CH}_2)_3\text{CH}_3$?

- A 4
- B 5
- C 6
- D 7

(Total 1 mark)

6. Propene reacts with hydrogen bromide to form a mixture of saturated organic products. The proton n.m.r. spectrum of the major organic product has

- A 3 peaks with relative intensities 3 : 2 : 2
- B 2 peaks with relative intensities 3 : 4
- C 3 peaks with relative intensities 3 : 1 : 3
- D 2 peaks with relative intensities 6 : 1

(Total 1 mark)

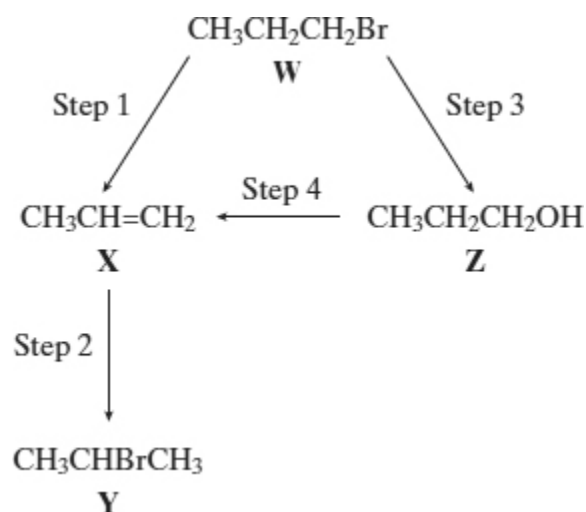
7. Which one of the following has a singlet peak in its proton n.m.r. spectrum?

- A ethyl propanoate
- B propyl methanoate
- C hexan-3-one
- D 2-chlorobutane

(Total 1 mark)

8.

For this question refer to the reaction scheme below.



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

- A **W** and **Y** are structural isomers.
- B **Z** is a primary alcohol.
- C **Y** gives two peaks in its proton n.m.r. spectrum.
- D **X** has geometrical isomers.

(Total 1 mark)

9.

Which one of the following does **not** have a singlet peak in its proton n.m.r. spectrum?

- A butyl methanoate
- B propyl ethanoate
- C ethyl propanoate
- D methyl butanoate

(Total 1 mark)

10.

Which one of the following pairs reacts to form an organic product with only 2 singlets in its proton n.m.r. spectrum?

- A ethene and bromine
- B propan-2-ol and acidified potassium dichromate(VI)
- C ethanol and concentrated sulphuric acid
- D epoxyethane and water in the presence of dilute sulphuric acid

(Total 1 mark)

11.

Which one of the following pairs of reagents reacts to form an organic product that shows only 2 peaks in its proton n.m.r. spectrum?

- A** butan-2-ol and acidified potassium dichromate(VI)
- B** ethanoyl chloride and methanol
- C** propanoic acid and ethanol in the presence of concentrated sulphuric acid
- D** ethene and hydrogen in the presence of nickel

(Total 1 mark)