21.1 Spectroscopic Identification of Organic compounds

Question Paper

Course	DP IB Chemistry
Section	21. Measurement & Analysis (HL only)
Topic	21.1 Spectroscopic Identification of Organic compounds
Difficulty	Easy

Time allowed: 10

Score: /5

Percentage: /100

Question 1

Which of the following pieces of information can X-ray crystallography **not** give directly?

A. The location of individual atoms

B. Internuclear distances

C. The identity of individual atoms

D. Bond angles

[1 mark]

Question 2

The IUPAC name of mellitene, $C_6(CH_3)_6$, is 1,2,3,4,5,6–hexamethylbenzene.

What splitting pattern will be seen on the ^1H NMR spectrum for mellitene?

A. Singlet

B. Doublet

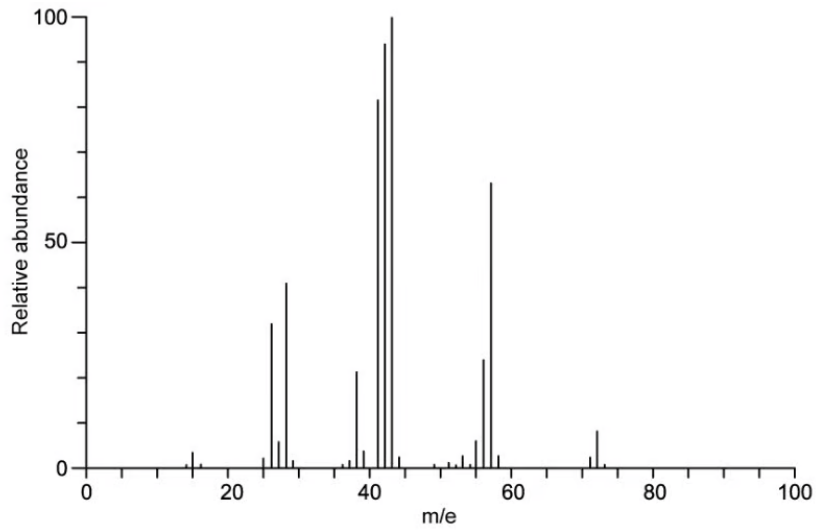
C. Triplet

D. Quartet

[1 mark]

Question 3

Using the mass spectrum below, what is the molecular ion peak of 2-methylbutane?



A. 29

B. 43

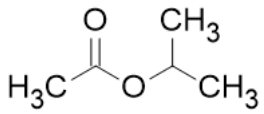
C. 57

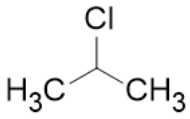
D. 72

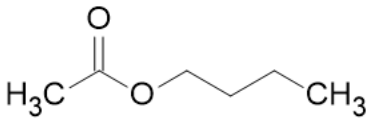
[1 mark]

Question 4

Which of the following chemicals has a singlet peak in its ^{1}H NMR spectrum?

I. 

II. 

III. 

A. I and II only

B. I and III only

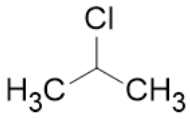
C. II and III only

D. I, II and III

[1 mark]

Question 5

The structure of 2-chloropropane is shown below.



Which description of the peaks in the ^{1}H NMR spectrum of 2-chloropropane is correct?

A. 1 peak with a relative intensity of 6

B. 2 peaks with relative intensities of 3 : 4

C. 2 peaks with relative intensities 6 : 1

D. 3 peaks with relative intensities of 3 : 1 : 3

[1 mark]