

## **A level Chemistry A**

**H432/02** Synthesis and analytical techniques

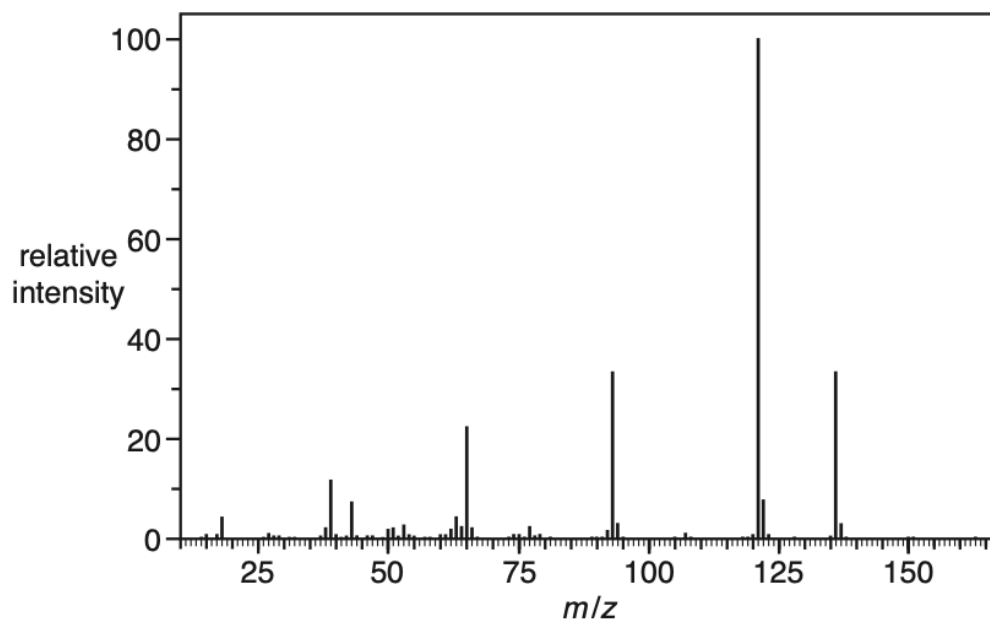
### **Question Set 12**

6. A chemist analyses a naturally occurring aromatic compound.

(a) The percentage composition and mass spectrum of the compound are shown below.

**Percentage composition by mass:** C, 70.58%; H, 5.92%; O, 23.50%.

**Mass spectrum**



Determine the molecular formula of the compound.

Show your working.

[3]

(b) Qualitative tests are carried out on the aromatic compound. The results are shown below.

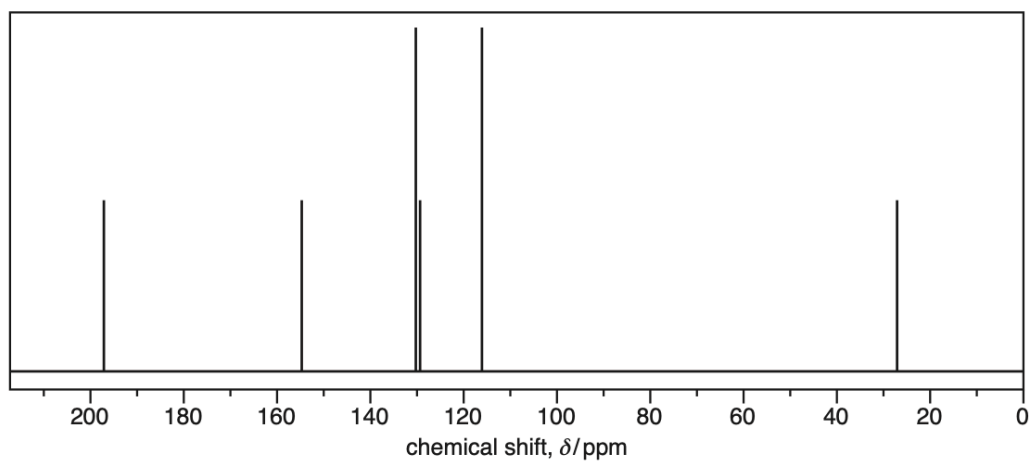
Test	Acidity	Na <sub>2</sub> CO <sub>3</sub> (aq)	2,4-DNP	Tollens' reagent
Observation	pH = 5	No observable change	Orange precipitate	No observable change

Determine the functional groups in the compound.

Explain your reasoning.

[3]

(c) The carbon-13 NMR spectrum of the compound is shown below.



Using the spectrum and the results from (a) and (b), determine the structure of the compound.

Explain your reasoning.

[3]

**Total Marks for Question Set 12: 9**

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