

Mass spectrometry

1 Propene was treated with bromine in the presence of chloride ions and the product analysed using mass spectrometry.

A group of peaks was found in the range m/e 156–160 with the following relative heights.

m/e	relative height
156	3
158	4
160	1

(i) Drag and drop the species responsible for each of these peaks.

156

C3H6^{35}Cl^{81}Br^+

158

C3H6^{37}Cl^{81}Br^+

160

C3H6^{35}Cl^{79}Br^+

C3H6^{37}Cl^{79}Br^+

A large peak was present in the spectrum with a m/e value of less than 20.

(ii) Suggest the m/e value for the peak and the species that produced it.

m/e

species

2 At one time, bromomethane, CH_3Br , was widely used to control insect pests in agricultural crops and timber. It is now known to break down in the stratosphere and contribute to the destruction of the ozone layer.

Samples can be screened for traces of bromomethane by subjecting them to mass spectrometry.

(i) Which peak(s) would show the presence of bromine in the compound?

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(ii) How could you tell by studying the M and $M+2$ peaks that the compound contained bromine rather than chlorine?

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