



MASS SPECTROMETRY

- 1 Copper contains two isotopes, $^{63}_{29}\text{Cu}$ and $^{65}_{29}\text{Cu}$. Give the formula of the species that reaches the detector first when a sample of copper is analysed by time of flight mass spectrometry.

(1)

- 2 Mass spectrometry showed an element to contain the following isotopes. Find the relative atomic mass of this element. Give your answer to 1 decimal place.

m/z	10	11
abundance / %	19.9	80.1

(2)

- 3 Lithium contains the isotopes ^6_3Li and ^7_3Li . It has a relative atomic mass of 6.94. Find the percentage abundance of ^7_3Li in lithium.

(2)

- 4 Beryllium contains one isotope only, ^9_4Be . Calculate the time of flight of $^9_4\text{Be}^+$ of this isotope. Give your answer to the appropriate number of significant figures.

$$t = d \sqrt{\frac{m}{2KE}}$$

t = time of flight (s)

m = mass of particle (kg)

KE = kinetic energy (J)

d = length of flight tube (m)

kinetic energy	$3.65 \times 10^{-14} \text{ J}$
length of flight tube	85 cm
mass of electron	$9.1094 \times 10^{-31} \text{ kg}$
mass of proton	$1.6726 \times 10^{-27} \text{ kg}$
mass of neutron	$1.6749 \times 10^{-27} \text{ kg}$

(2)