SMART EXAM RESOURCES

1

9701 CAMBRIDGE AS CHEMISTRY

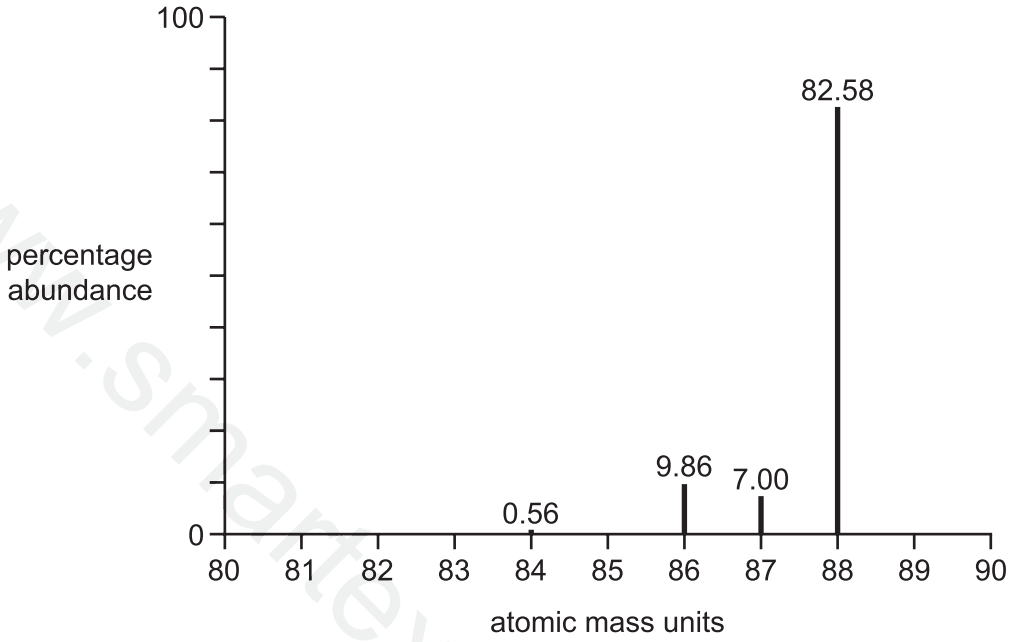
TOPIC QUESTIONS AND MARK SCHEMES

TOPIC :Analysis

SUB-TOPIC: Mass Spectrometry

SET-2-QP-MS

1 A sample of strontium, atomic number 38, gave the mass spectrum shown. The percentage abundances are given above each peak.



a (i) Complete the full electronic configurationofstrontium.

$1s^2\ 2s^2\ 2p^6$ ..... [1]

(ii) Explain why there are four different peaks in the mass spectrum of strontium.

.....

..... [1]

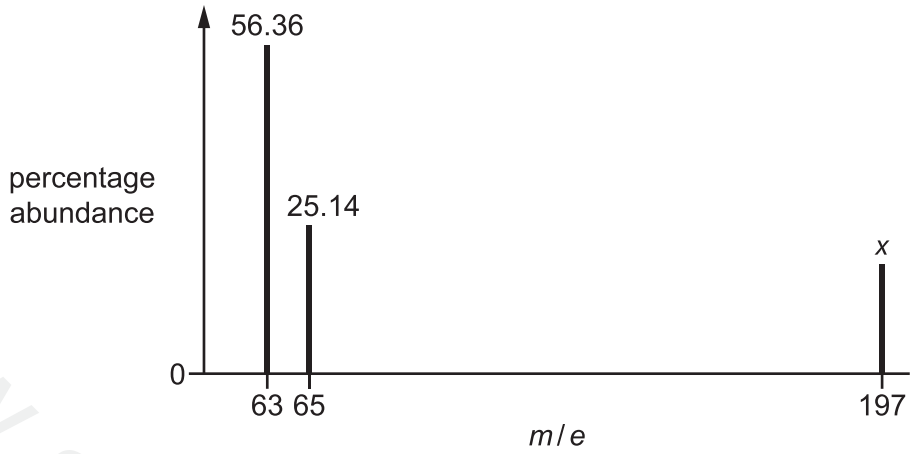
(iii) Calculate the atomic mass, A_r, of this sample of strontium.
Give your answer to **three** significant figures.

A_r = ... [2]

Mark Scheme:

(i)	$(1s^2\ 2s^2\ 2p^6)\ 3s^2\ 3p^6\ 3d^{10}\ 4s^2\ 4p^6\ 5s^2$	1	[1]
(ii)	four isotopes owtte	1	[1]
(iii)	$\frac{(84\times0.56)+(86\times9.86)+(87\times7)+(88\times82.58)}{100}$ = 87.7 (must be 3 sig figs)	1 1	[2]

2 *Tumbaga* is an alloy of copper and gold. A sample of tumbaga was analysed. The mass spectrum of the sample is shown.



(i) Calculate the percentage abundance of gold, *x*, in the sample of tumbaga.

x = ... % [1]

(ii) Calculate the relative atomic mass, A_r, of the copper present in this sample.
Give your answer to **two** decimal places.

A_r (Cu) = ... [2]

Mark Scheme:

)(i)	(100 – 56.36 – 25.14) = 18.5(0)	**1**
(ii)	**M1** correct use of ^{63}Cu and ^{65}Cu and their % abundance [1] **M2** ÷ (56.36 + 25.14) **AND** answer correct to two decimal places [1]	**2**