

Relative Atomic Mass Worksheet

Question 1

Define relative atomic mass

Question 2

Define isotopic mass

Question 3

Boron has two naturally occurring isotopes with the natural abundances shown in the table below:

Isotope	Natural abundance (%)
^{10}B	19.9
^{11}B	80.1

Calculate the relative atomic mass of boron.

Question 4

Rubidium has a relative atomic mass of 85.47 and consists of two naturally occurring isotopes, ^{85}Rb ($M = 84.91$) and ^{87}Rb ($M = 86.91$). Calculate the percentage composition of these isotopes in a naturally occurring sample of rubidium.

Question 5

Lithium has two naturally occurring isotopes: ^6Li (7% abundance) and ^7Li (93% abundance). Calculate the relative atomic mass of lithium.

Question 6

Iridium has a relative atomic mass of 192.22 and consists of Ir-191 and Ir-193 isotopes. Calculate the percentage composition of a naturally occurring sample of iridium.

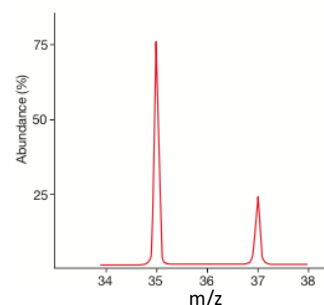
Question 7

Chromium has four naturally occurring isotopes, and their masses and natural abundances are shown in the table below. Calculate the relative atomic mass of chromium to two decimal places.

Isotope	Natural abundance (%)
^{50}Cr	4.35
^{52}Cr	83.79
^{53}Cr	9.50
^{54}Cr	2.36

Question 8

Deduce the relative atomic mass of chlorine to two decimal places from the mass spectra shown on the right.



Question 9

Titanium exists as several isotopes. The mass spectrum of a sample of titanium gave the following data.

- Calculate the relative atomic mass of titanium to two decimal places.
- State the number of protons, neutrons and electrons in the $^{48}_{22}\text{Ti}$ atom.

Mass number	% abundance
46	7.98
47	7.32
48	73.99
49	5.46
50	5.25

Question 10

Naturally occurring silver is composed of two stable isotopes, ^{107}Ag and ^{109}Ag . The relative atomic mass of silver is 107.87. Show that isotope ^{107}Ag is more abundant.

Question 11

Mass spectroscopic analysis of a sample of magnesium gave the following results. Calculate the relative atomic mass, A_r , of this sample of magnesium to two decimal places.

	% abundance
Mg-24	78.60
Mg-25	10.11
Mg-26	11.29

Question 12

- a) State the relative mass and charge of the subatomic particles of an atom.

	Relative mass	Relative charge
Proton	+1
Electron	5×10^{-4}
Neutron

- b) Calculate the number of neutrons and electrons in one atom of ^{65}Cu
 c) State one difference in the physical properties of the isotopes of ^{63}Cu and ^{65}Cu and explain why their chemical properties are the same.
 d) Describe the bonding in solid copper.
 e) Suggest **two** properties of copper that make it useful and economically important.

Question 13

A sample of vaporized elemental magnesium is introduced into a mass spectrometer.

- a) One of the ions that reaches the detector is $^{26}\text{Mg}^+$. Calculate the number of protons, neutrons and electrons in the $^{26}\text{Mg}^+$ ion.
 b) The sample contained the three isotopes ^{24}Mg , ^{25}Mg and ^{26}Mg . The relative percentage abundances of ^{25}Mg and ^{26}Mg are 10.00% and 11.01% respectively. Calculate the relative atomic mass (A_r) of magnesium, accurate to **two** decimal places.