

Mohamed Khider University of Biskra
Faculty of Exact Sciences and Natural and Life Sciences

1st year LMD – SNV Biology
Subject: Chemistry 1

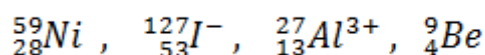
Academic year: 2023/2024

Applied exercises series No. 1
(Fundamentals of chemistry)

Exercise 1:



1. Numerical indications in the three positions A, Z and q can be given to the symbol X of an element. What exactly does each of them mean?
2. Give the numbers of protons, electrons and neutrons of the different elements:



3. Calculate the mass of the Beryllium atom in grams and atomic mass units (a.u.m.).
We give: $m_p=1.67 \cdot 10^{-27}$; $m_N=1.67 \cdot 10^{-27}$; $m_e = 9.11 \cdot 10^{-31}$ (en Kg).

Exercise 2:

1. Calculate the charge of ${}^A_ZX^q$ an iron core (Fe, A=56, Z=26)
2. An atom has the symbol A_ZX its nucleus has a charge equal to $1.12 \cdot 10^{-18}$ C and it has 7 neutrons.

Determine A and Z.

Exercise 3:

1. Four nuclides A, B, C and D have nuclei made up as shown below:

	A	B	C	D
Protons number	21	22	22	20
Neutrons number	26	25	27	27
Masses number	47	47	49	47

Are there isotopes among these four nuclides?

2. Magnesium is a mixture of the following three isotopes: ${}^{24}\text{Mg}$ (78.99%); ${}^{25}\text{Mg}$ (?); ${}^{26}\text{Mg}$ (11.01%).

- a. Calculate the abundance of the second isotope.
- b. Calculate the average relative atomic mass (isotope average) of magnesium.

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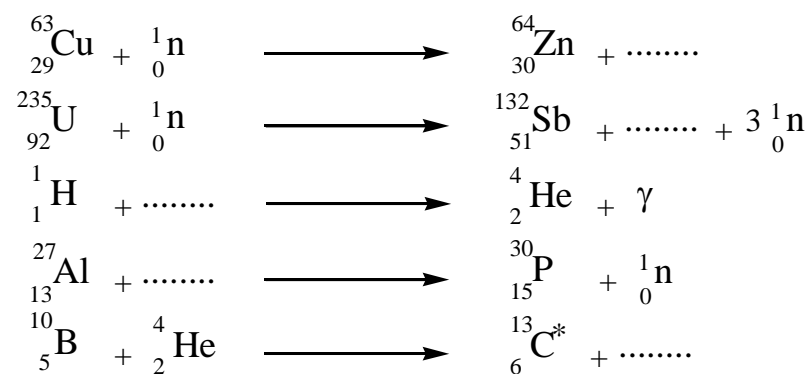
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Applied exercises series No. 2
 (Nuclear reactions and radiation)

Exercise 1:

Complete the following nuclear reactions and indicate their nature:



Exercise 2:

The β^- -decay period of carbon-14 is $5.7 \cdot 10^3$ years.

1. Write the decay reaction of carbon-14.
2. Calculate the decay constant λ .
3. Calculate the time after which 90% of the element has disintegrated.

Exercise 3:

Write in detail the following reactions and complete them with the missing particles:

