

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

**1<sup>st</sup> year LMD – SNV Biology**  
**Subject: Chemistry 1**

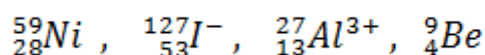
**Academic year: 2024/2025**

**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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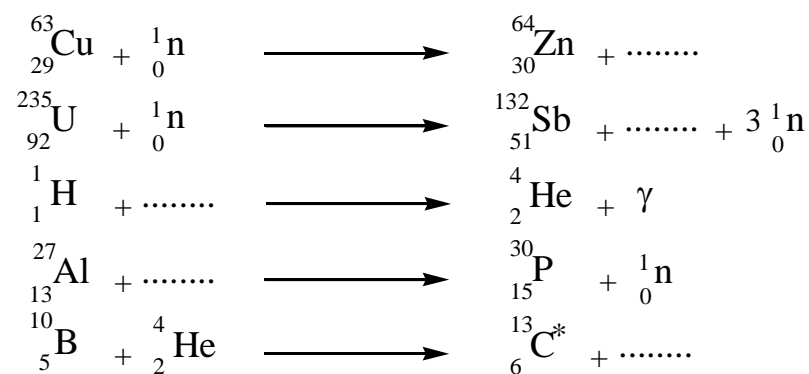
**1<sup>st</sup> year LMD – SNV Biology**  
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**Applied exercises series No. 2**  
(Nuclear reactions and radiation)

**Exercise 1:**

Complete the following nuclear reactions and indicate their nature:



**Exercise 2:**

The  $\beta^-$ -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  $\lambda$ .
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:

