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

1st year LMD – SNV Biology **Academic year: 2025/2026**
Subject: Chemistry 1

Applied exercises series No. 3

(Electronic configuration of atoms)

Exercise 1:

Consider one of the electrons of an atom characterized by the principal quantum number n=3.

1. Indicate the possible values of the other quantum numbers of this electron.

2. How many atomic orbital and electrons are associated with n=3?

Exercise 2:

Are the following triples of quantum numbers possible or not for the same electron?

1/ n= 3, l=0, m=0 ; **2/** n= 2, l=2, m=0 ; **3/** n= 0, l=0, m=0 ;

4/ n=2, l=1, m=-1 ; **5/** n= 3, l=1, m=-2

Exercise 3:

The nuclear fusion reaction below revealed a new chemical species $^{A}_{Z}X$:

$$^{86}_{36}\mathbf{Kr} + {}^{208}_{82}\mathbf{Pb} \rightarrow {}^{A}_{Z}\mathbf{X} + {}^{1}_{0}\mathbf{n}$$

1. Identify this element (A and Z).

2. Predict its electronic structure.

3. What are the elements belonging to the same group as X called?

4. Give the electronic configurations of all these elements.

Exercise 4:

We consider the following atoms and ions:

$_{17}Cl$, $_{19}K$, $_{26}Fe$, $_{28}Ni$, $_{29}Cu$, $_{35}Br$, $_{40}Zr$, $_{42}Mo$, Fe^{2+}, Cl^{-}

1. Give the electronic configuration of atoms and ions by presenting the valence electrons using the vacant boxes.

2. Locate these elements in the periodic table (give the block, period and group).

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Applied exercises series No. 4

(Periodic classification)

Exercise 1:

An element has less than 18 electrons and has 2 single electrons. What is this element, knowing that it belongs to the Lithium period ($_{3}$Li) and the Tellurium group ($_{52}$Te).

Exercise 2:

We have the elements: $_{55}$Cs, $_{37}$Rb, $_{48}$Cd and $_{51}$Sb

1. Indicate the block, period and group of each element
2. Locate all the elements on the periodic table.
3. Arrange them in order of decreasing atomic radius.

Exercise 3:

1. Arrange increasing order of the electro-negativity of the different atoms, justifying your answer: $_{19}$K, $_{26}$Fe, $_{30}$Zn and $_{37}$Rb

2. Consider the following elements: $_{11}$Na, $_{47}$Ag, $_{53}$I, $_{56}$Ba

Predict those that form cations or anions (ions). Justify your answer.

Exercise 4:

Classify in ascending order of first ionization energy, justifying your answer:

1. Alkalis: $_{11}$Na, $_{19}$K et $_{37}$Rb

2. Various atoms or ions: $_{8}$O, $_{10}$Ne, $_{11}Na^{+}$ et $_{11}$Na.