

ATOMS AND MOLECULES

SUBJECT-CHEMISTRY
CHAPTER NO- 3

Introduction to Electronic Configuration, Orbitals and Orbitals
PERIOD-5

CHANGING YOUR TOMORROW



LEARNING OBJECTIVE

Students will be able to

- Know about the concept of electronic configuration.
- Get aware of the orbits and orbitals.
- Know about the electronic configuration of some elements.



ELECTRONIC COFIGURATION

- ❖ The arrangements of electrons in the orbits of an Atom is known as Electronic Configuration.
- ❖ The electrons are arranged according to the $2n^2$ formula , where n=Number of Shell.
- ❖ K –Shell $n=1$, $2(1)^2= 2$ Electrons
- ❖ L- Shell $n=2$, $2(2)^2= 8$ Electrons
- ❖ M-Shell $n=3$, $2(3)^2 = 18$ Electrons respectively



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CONCEPT OF ORBITS

- The electrons revolve around the nucleus of an atom in a fixed energy level or shell known as Orbit.
- There are fixed number of electrons in a given orbit.
 - ❖ The electrons are arranged according to the $2n^2$ formula , where n=Number of Shell.
 - ❖ K –Shell n=1 , $2(1)^2= 2$ Electrons
 - ❖ L- Shell n=2 , $2(2)^2= 8$ Electrons
 - ❖ M-Shell n=3 , $2(3)^2 = 18$ Electrons respectively



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CONCEPT OF SUBSHELLS



- The shell of an atom is again sub divided into sub-shell like S,P, d and f orbitals.
- Each orbital can hold at least 2 electrons.
- The total number of electrons present in different sub-shells are given as follows–
- S-Sub-shell- 2 Electrons
- P-Sub-shell- 6 Electrons
- d- Sub-shell-10 Electrons
- f- Sub-shell-14 Electrons



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ELECTRONIC CONFIGURATION OF ELEMENTS

Atomic Number	Element	Symbol	Electronic configuration	Subshell electronic configuration
1	Hydrogen	H	1	$1s^1$
2	Helium	He	2	$1s^2$
3	Lithium	Li	2 1	$1s^2 2s^1$
4	Beryllium	Be	2 2	$1s^2 2s^2$
5	Boron	B	2, 3	$1s^2 2s^2 2p^1$
6	Carbon	C	2, 4	$1s^2 2s^2 2p^2$
7	Nitrogen	N	2, 5	$1s^2 2s^2 2p^3$
8	Oxygen	O	2, 6	$1s^2 2s^2 2p^4$
9	Fluorine	F	2, 7	$1s^2 2s^2 2p^5$
10	Neon	Ne	2, 8	$1s^2 2s^2 2p^6$
11	Sodium	Na	2, 8, 1	$1s^2 2s^2 2p^6 3s^1$
12	Magnesium	Mg	2, 8, 2	$1s^2 2s^2 2p^6 3s^2$
13	Aluminum	Al	2, 8, 3	$1s^2 2s^2 2p^6 3s^2 3p^1$
14	Silicon	Si	2, 8, 4	$1s^2 2s^2 2p^6 3s^2 3p^2$
15	Phosphorus	P	2, 8, 5	$1s^2 2s^2 2p^6 3s^2 3p^3$
16	Sulfur	S	2, 8, 6	$1s^2 2s^2 2p^6 3s^2 3p^4$
17	Chlorine	Cl	2, 8, 7	$1s^2 2s^2 2p^6 3s^2 3p^5$
18	Argon	Ar	2, 8, 8	$1s^2 2s^2 2p^6 3s^2 3p^6$
19	Potassium	K	2, 8, 8, 1	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$
20	Calcium	Ca	2, 8, 8, 2	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$
21	Scandium	Sc	2, 8, 8, 3	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^1 4s^2$
22	Titanium	Ti	2, 8, 8, 4	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^2 4s^2$
23	Vanadium	V	2, 8, 8, 5	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^3 4s^2$
24	Chromium	Cr	2, 8, 8, 6	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^4 4s^1$
25	Manganese	Mn	2, 8, 8, 7	$1s^2 2s^2 2p^6 3s^2 3p^6 3d^5 4s^1$

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HOME ASSIGNMENT

- Exercise –II Q3
- write the electronic configuration of the following elements

- 1) Calcium
- 2) Oxygen
- 3) Chlorine
- 4) Sodium



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THANKING YOU

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