

ATOMS AND MOLECULES

SUBJECT-CHEMISTRY

CHAPTER NO- 3

Introduction to Electronic Configuration, Orbits 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 Orbits.
- 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



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



ELECTRONIC COFIGURATION 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 ⁵ 4s ¹
25	Manganese	Mn	2, 8, 8, 7	1s ² 2s ² 2p ⁶ 3s ² 3p ⁶ 3d ⁵ 4s ²



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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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