



STD 10– FIRST BELL – CHEMISTRY – CLASS-04

Chapter – 1

## PERIODIC TABLE AND ELECTRONIC CONFIGURATION

### Previous knowledge

- The chemical and physical properties of elements are periodic functions of their atomic number.
- The total number of protons in an atom is called its Atomic Number (Z).
- Mass number is the total number of protons and neutrons.
- Electrons revolve around the nucleus of an atom in fixed paths called orbits or shells.
- The energy of the shells increases as the distance from the nucleus increases.
- The maximum number of electrons that can be accommodated in any given shell is  $2n^2$ .
- The shells around the nucleus can be numbered from near the nucleus as 1,2 ,3,4,5.... or represented by the letters K, L, M, N, O.....

Shell	Shell Number	Maximum number of electrons
K	1	2
L	2	8
M	3	18
N	4	32

### Electronic configuration

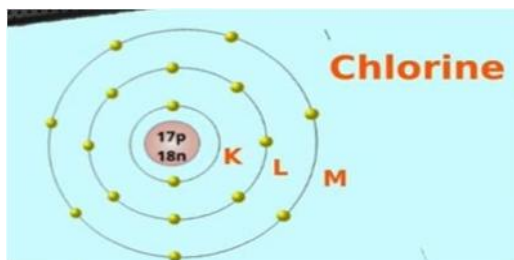
Element	Atomic Number	Electronic configuration
C	6	2,4
Mg	12	2,8,2
Ar	18	2,8,8

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### Activity 1:

Bohr atom model of Chlorine atom:



Atomic number	17
Mass number	35
Number of Protons	17
Number of Electrons	17
Number of Neutrons	18
Electronic configuration	2,8,7
Period Number	3
Group Number	17
Metallic or Non Metallic	Non metallic
Highest energy shell	M shell

### Subshell

- The electronic configuration of Argon is 2, 8, 8. But in the case of potassium is 2,8,8,1. (Bohr model is a simple explanation of the atomic structure. Limitation of Bohr model and new assumptions were postulated.)
- **Electrons in each energy level are arranged in its sub energy levels.**
- **Each sub energy level in a shell is called a Subshell. They are named as s, p, d, f respectively.**
- **Each main energy level "K" except has more than one subshell.**
- **The number of subshells in each energy level is equal to its shell number.**

Shell number	1	2	3	4
Subshells	s	s, p	s, p, d	s, p, d, f

- **s subshell is common to all subshells.**
  - **1s indicate the 's' subshell of the first subshell and "2s" indicate the s subshell of the second shell**
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## A+ CHEMISTRY - STD X

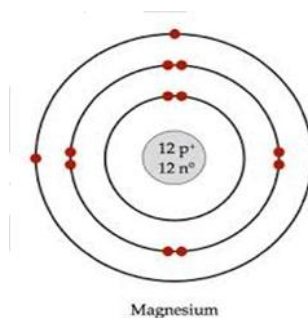
Shell number	1	2		3			4			
Maximum number of electrons that can be accommodated in each shell	2	8		18			32			
Subshell	1s	2s	2p	3s	3p	3d	4s	4p	4d	4f
Maximum number of electrons that can be accommodated in each subshell	2	2	6	2	6	10	2	6	10	14

- The maximum no of electrons that can be accommodated in each subshell is....

Subshell	s	p	d	f
Maximum number of electrons that can be accommodated	2	6	10	14

### HOME WORK:

1. If a Bohr atom model of a Magnesium atom is given, find the answers of the following questions.



- a) What is the atomic number of this element?
- b) Write the shell wise electronic configuration of this atom?
- c) Identify the subshells in each shell?
- d) How many electrons are present in each subshell? How can they represent them?

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