UDAAN

2025

Bharat Mata Ki Jai ♡

ESSENTIAL CHEMISTRY BASICS for Class 10

MASTER BASICS OF CHEMISTRY – II

CHEMISTRY | Lecture - 02

BY: SUNIL BHAIYA

Topics

to be covered

1. Bohr's-Bury Rule/Scheme
2. Valency and Its Calculation

Knowledge Ride On

Bohr's-Bury Rule/Scheme

Knowledge Ride On

Element	Symbol	Number of electrons	1st shell	2nd shell	3rd shell	4th shell	Electron configuration
Hydrogen	H	1	1				1
Helium	He	2	2				2
Lithium	Li	3	2	1			2,1
Beryllium	Be	4	2	2			2,2
Boron	B	5	2	3			2,3
Carbon	C	6	2	4			2,4
Nitrogen	N	7	2	5			2,5
Oxygen	O	8	2	6			2,6
Fluorine	F	9	2	7			2,7
Neon	Ne	10	2	8			2,8
Sodium	Na	11	2	8	1		2,8,1
Magnesium	Mg	12	2	8	2		2,8,2
Aluminium	Al	13	2	8	3		2,8,3
Silicon	Si	14	2	8	4		2,8,4
Phosphorus	P	15	2	8	5		2,8,5
Sulphur	S	16	2	8	6		2,8,6
Chlorine	Cl	17	2	8	7		2,8,7
Argon	A	18	2	8	8		2,8,8
Potassium	K	19	2	8	8	1	2,8,8,1
Calcium	Ca	20	2	8	8	2	2,8,8,2

Valency and Its Calculation

Knowledge Ride On

Non-academic Doubt Resolution

Knowledge Ride On

Insaniyat Ka Gyaan

RIDDLE WALLAH

Hydrogen (H)

Iodine (I)

Hasmukhlal: Hi! My name is Hasmukhlal. Can you please give me your notebook?

Simaila: Reply of Simaila was similar to the word formed by the chemical symbols of elements with atomic number 7 and 8.

Atomic no. (z) → 7 → Nitrogen (N)

→ 8 → Oxygen (O)

NO

RIDDLE WALLAH

Hasmukhlal: Hi! My name is Hasmukhlal. Can you please give me your notebook?

Simaila: Reply of Simaila was similar to the word formed by the chemical symbols of elements with atomic number 7 and 8.

Sundar Balak/Sundar Kanya Be Like:

Class IX → Structure of Atom

Bohr's-Bury Rule/ Scheme

filling of electrons in different shells around nucleus

FUN FACT: *Proposed in 1921 simultaneously by Charles Bury and Neils Bohr.*

In 1921 → Second atomic model

↓ After 3 weeks

Charles Bury presented the same rule/ scheme in his research paper.

Bohr's-Bury Rule/Scheme

(i) The maximum number of electrons that can be accommodated in a shell is given by the formula $2n^2$. Moreover, filling of electrons always start from inner shells. → [K → L .....]

(कोश)

K, $n=1$, $2\times(1)^2 = 2$ electrons

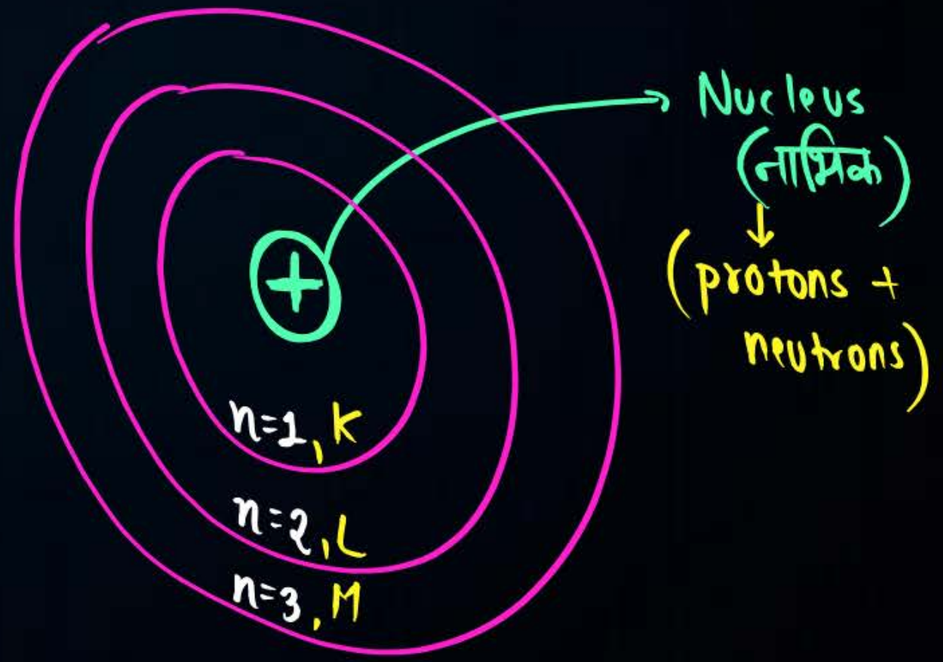
L, $n=2$, $2\times(2)^2 = 8$ electrons

M, $n=3$, $2\times(3)^2 = 18$ electrons

N, $n=4$, $2\times(4)^2 = 32$ electrons

⋮

so on



Bohr's-Bury Rule/Scheme

(नील)

Element	Atomic or proton number (Z)	Number of electrons	K, L
Hydrogen (H)	1	1	1
Helium (He)	2	2	2
Lithium (Li)	3	3	2, 1
Berryllium (Be)	4	4	2, 2
Neon (Ne)	10	10	2, 8

Let's Practice

PW Ka ChemStar!

QUESTION

According to Bohr's-Bury scheme, maximum number of electrons in a given shell is given by:

A $2n$

B $2n^2$

C $2n^3$

D $2n^4$

QUESTION

Element 'X' has 10 electrons, the electrons will first fill in which of the following shell?

K	L
2	8

A K

B L

C M

D N

Bohr's-Bury Rule/Scheme

(b) if valence shell is K → can't have more than 2 electrons

(a)

(ii) The outermost shell/valence shell (संयोजकता कोश) cannot have more than 8 electrons and the next inner shell to it, i.e. penultimate shell (उपांतिम कोश) cannot have more than 18 electrons.

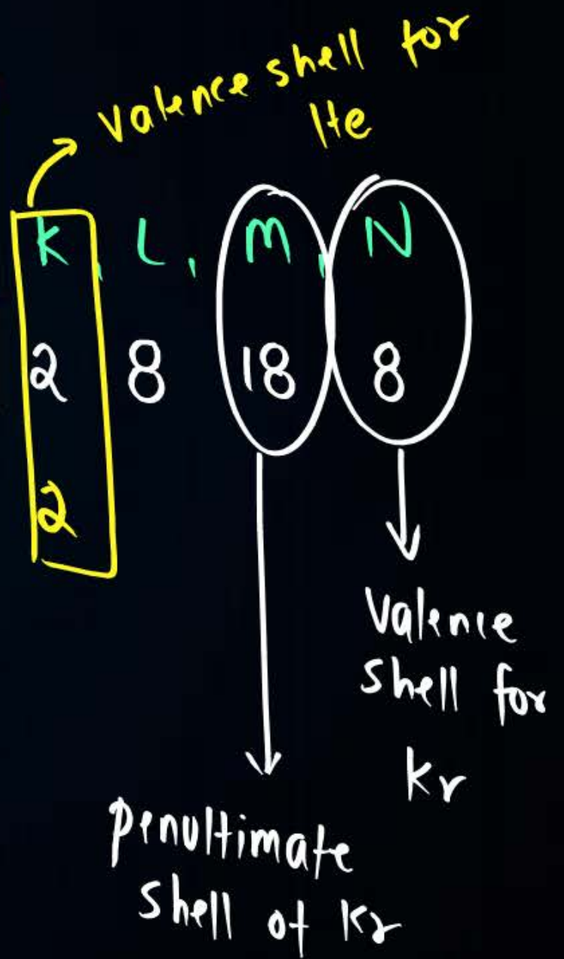
Consider an element with 3 shells.

→ Outermost shell / valence shell

→ penultimate shell

Bohr's-Bury Rule/Scheme

Element	Atomic or proton number	Number of electrons
(ii) → (b) Krypton (Kr)	36	36
(ii) → (a) Helium (He)	2	2



Bohr's-Bury Rule/Scheme

(iii) Even if the capacity of the penultimate shells (उपांतिम कोश) exceeds 8, it cannot have more than 8 electrons unless there are 2 electrons in the outermost shell/valence shell (संयोजकता कोश) .

Element	A.No.(Z) / proton no.	no. of electrons	K	L	M	N	
Potassium (K)	19	19	2	8	9		(X)
Calcium (Ca)	20	20	2	8	10		(X)

Bohr's-Bury Rule/Scheme

Element	Atomic or proton number	Number of electrons
Potassium (K)	19	19
Calcium (Ca)	20	20
Scandium (Sc)	21	21

penultimate shell

valence shell

K	L	M	N
2	8	8	1
2	8	8	2
2	8	9	2

Let's Practice

PW Ka ChemStar!

QUESTION

What will be the electronic configuration of Chlorine (Cl)?

	A. No. (z)	proton no.	no. of electrons	K L M
Chlorine (Cl)	17		17	2, 8, 7

A 2, 8, 1

B 2, 8, 8

C 2, 8, 7

D 2, 8

(संयोजकता)

Valency and Its Calculcation

Valency (संयोजकता)

how many electron(s) an atom lose, gain or share

The combining capacity of an atom of an element to attain nearest stable noble gas configuration.

(उत्कृष्ट गैस)

Analysed noble gases [initially, called inert gases]

↓

Show little reactivity [बहुत कम react करती हैं]

↓

STABLE ELECTRONIC CONFIGURATION

Kossel-Lewis approach (Octet Rule / Duplet Rule)

		atomic no.(z)	K
Heena	Helium (He)	2	2
Neena	Neon (Ne)	10	2, 8
Aur	Argon (Ar)	18	2, 8, 8
kareena	Krypton (Kr)	36	2, 8, 18, 8
ka	Xenon (Xe)	54	2, 8, 18, 18, 8
X-Ray	Radon (Rn)	86	2, 8, 18, 32, 18, 8
Rangeen			

DUPLET RULE → outermost shell / valence shell → K → 2 electrons in that [similar to He]

OCTET RULE → outermost shell Other than K → 8 electrons in that [similar to nearest noble gas]

Nearest noble gas configuration means?

	A.No. (Z)	no. of electrons	K	L	M
Helium (He)	2	2	2		
Lithium (Li)	3	3	2	(1) → lose it to become similar to He	
Neon (Ne)	10	10	2	8	
Sodium (Na)	11	11	2	8	(1) → lose it to become similar to Ne
Chlorine (Cl)	17	17	2,	8,	7 ← gains 1 electron to become similar to Ar
Argon (Ar)	18	18	2,	8,	8

Calculation of Valency (संयोजकता)

Imp → Don't put charge (+ve & -ve) before & after the number while writing valency

- If outermost shell / valence shell has 1, 2, 3, 4 electrons then the valency will be: 1, 2, 3, 4
- If outermost shell has 5, 6 and 7 electrons then the valency will be:
  - 8 - 5 => 3
  - 8 - 6 => 2
  - 8 - 7 => 1
- Valency of noble gases is: 0

A.No. (Z)	Element	Symbol	Number of electrons	1st shell K	2nd shell L	3rd shell M	4th shell N	Electron configuration	Valency
1	Hydrogen	H	1	1				1	→ 1
2	Helium	He	2	2				2	→ 0
3	Lithium	Li	3	2	1			2.1	→ 1
4	Beryllium	Be	4	2	2			2.2	→ 2
5	Boron	B	5	2	3			2.3	→ 3
6	Carbon	C	6	2	4			2.4	→ 4
7	Nitrogen	N	7	2	5			2.5	(8-5) → 3
8	Oxygen	O	8	2	6			2.6	(8-6) → 2
9	Fluorine	F	9	2	7			2.7	(8-7) → 1
10	Neon	Ne	10	2	8			2.8	→ 0
11	Sodium	Na	11	2	8	1		2.8.1	→ 1
12	Magnesium	Mg	12	2	8	2		2.8.2	→ 2
13	Aluminium	Al	13	2	8	3		2.8.3	→ 3
14	Silicon	Si	14	2	8	4		2.8.4	→ 4
15	Phosphorus	P	15	2	8	5		2.8.5	(8-5) → 3
16	Sulphur	S	16	2	8	6		2.8.6	(8-6) → 2
17	Chlorine	Cl	17	2	8	7		2.8.7	(8-7) → 1
18	Argon	Ar	18	2	8	8		2.8.8	→ 0
19	Potassium	K	19	2	8	8	1	2.8.8.1	1 → 2
20	Calcium	Ca	20	2	8	8	2	2.8.8.2	

EXTRA

FUN FACT

- Some metals (धातु) (type of elements) that lose electron(s) from penultimate shell as well can show variable valency as well.
- Some non-metals (अधातु) (type of elements) like phosphorus, sulphur etc. can also show variable valency.

(3,5)

Metals	Valency	
Iron (Fe)	2	Ferrous
	3	Ferric
Copper (Cu)	1	Cuprous
	2	Cupric
Mercury (Hg)	1	Mercurous
	2	Mercuric
Lead (Pb)	2	Plumbous
	4	Plumbic
Tin (Sn)	2	Stannous
	4	Stannic

छोटी वाली

Lower valency → ...ous

Higher —"— (बड़ी वाली) → ...ic

Ends with

Let's Practice

aye ♡

PW Ka ChemStar!

QUESTION

The valency of helium gas will be :

helium gas → noble gas

A 1

B 8

C 0

D 3

QUESTION

The valency of potassium (K) will be :

	A.No.(z)	no. of electrons	K	L	M	N
Potassium (K)	19	19	2	8	8	1

valency = 1

A 1

B 2

C 3

D 4

QUESTION

The valency of carbon (C) will be :

	A.No.(z)	no. of electrons	K	L
Carbon(C)	6	6	2,	4

Valence shell

Valency = 4

A 1

B 2

C 3

D 4

KYA BOLTI PUBLIC

aye

Concept Polish (गृहकार्य)

QUESTION Homework

Elements with valency 1 are:

A always metals

B always metalloids

C either metals or non-metals

D always non-metals

Element	Metal/Non-metal	Valency
Hydrogen		
Sodium		
Chlorine		

Non-academic Doubt Resolution

Tumhe dimag ko harana hai ♡

Gyanendriyo ko vash mein karo!

BRAIN

Class Xth Boards Feb/March 2025

Dimag be like

Abhi tension mat le, aarom se ho jayega

(1)

Shreya Upadhyay 14 mins ago

sir class 9th me to padhne me man lgta tha .. pr jbse class 10 th me move Kiya hai tbse pta nhi Kyu padhne me mn nhi lgta... lambe time tk lectures bhi nhi dekh pate bahut neend ati hai hm khud bhi sochte h ke apne comfort zone se bahar nikle pr nikal nhi pate... upr se sb class 10th. hai ... padh lo etne percent chaiye ... ye sari family or society ke demands rehti hai pr ab to jaise padhne me mn he nhi lgta hai hm padhna chahte hai pr padh nhi pate to.. plz eske liye koi solution bataiye .

(2)

Dolly Kumari 55 mins ago

BHAIYA, please tell how to manage school formalities and self study ? I'm always stuck with school work and can't able to do self study . PLEASE BHAIYA GIVE SOME HACK

→ Efficiency badhao → Video will be uploaded

Non-academic Doubt Resolution

III

Divyanshu Kuntal 1 hours ago

sir ap ncert kab start karaoge → Chemical Rx^n & Eqn

Udaan 2025
Lec 09

IV

Monika Yadav 2 hours ago

sir ye notes me likhna hai?

Art of note making → Video

V

Garima 13 mins ago

sir mera ek doubt h kya m yh classes skip krke khazana se video watch krke doubt tha phuch skti hu sir mera ek schedule ni ho pata sir time management bhi ni kr pati plss guide me

I Khazana + Doubt (✓)

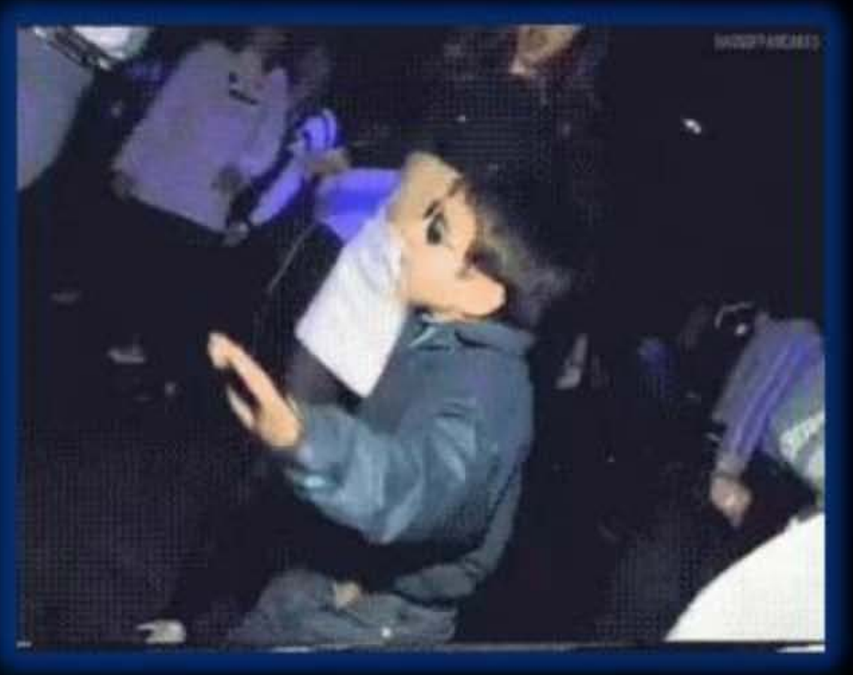
Best → Udaan 2025 (Recorded) + Doubt (✓)

EFFICIENCY HACKS BY SUNIL BHAIYA

Evening meal

Healthy Supper Options for Students Studying During Evening

(i) Cowpea Chaat
(ii) Sweet potato and spinach cutlets
(iii) Cornflakes with milk
(iv) Brown bread with butter and turmeric milk
(v) Turmeric milk with roasted chana



Insaniyat Ka Gyaan Jo Banae Behtar Insan

काक चेष्टा, बको ध्यानं,
स्वान निद्रा तथैव च ।
अल्पहारी, गृहत्यागी,
विद्यार्थी पंच लक्षणं ॥

Insaniyat Ka Gyaan

तन की सुंदरता (✗)
मन की सुंदरता (✓)

Prachi Nigam

- UP Class 10th Topper (2023-24)
- 98.50%

SUNIL BHAIYA IS ALWAYS THERE FOR YOU.

#sbsathhai

#pwsathhai

THANK YOU