

A photograph of laboratory glassware, including a beaker and a graduated cylinder, with a dark semi-transparent rectangle overlaid in the center containing the title text. The background is a blurred laboratory setting.

# PERIODIC PROPERTIES OF ELEMENTS



*A. BASIC INTRODUCTION*

*B. PERIODIC TABLE*

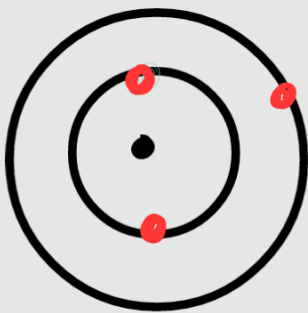
*C. ATOMIC RADII*

*D. IONIZATION ENTHALPY*

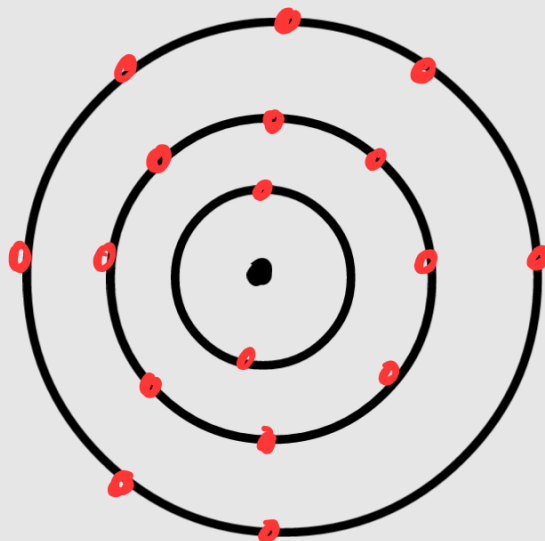
## A. Basic introduction :

Atomic number ( $Z$ ) = Number of electrons ( $e^-$ )  
= Number of protons ( $p$ )

**Nuclear charge:** It is the Positive charge found at the center of an atom, primarily due to the protons within it.



Li(3)



Cl(17)

# B. PERIODIC TABLE :

Group ►	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Period ▼																		<i>Noble gases</i>
<i>Nonmetals</i>	1 H																	2 He
<i>Metals</i>	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
	11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
	19 K	20 Ca											31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
	37 Rb	38 Sr											49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
	55 Cs	56 Ba											81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
	87 Fr	88 Ra											113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og
	s-block (plus He)		f-block		d-block								p-block (excluding He)					
			Lanthanides		57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb
			Actinides		89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No

Groups :18

Periods: 7



## C.Atomic Radii :

the distance from the centre of the nucleus to the outermost shell containing the electrons.

## Variations of Atomic radius in periodic table

### Variation in a period :

The atomic radii of the elements generally decreases from left to right.

**Explanation** :From left to right the number of protons (and therefore the positive nuclear charge) increases, while the number of electron shells remains the same. This increased nuclear charge exerts a stronger attraction on the electrons, pulling them closer to the nucleus and resulting in a smaller atomic radius.

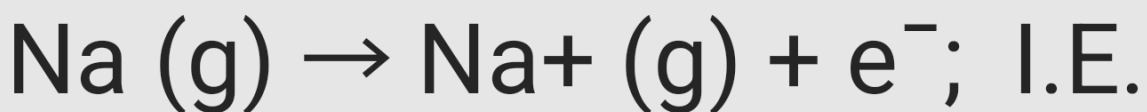
## **Variation in a group :**

The atomic Radii of elements in every group of periodic table increases as we move downwards.

**Explanation** :Down a group, the number of energy shells ( $n$ ) increases, so there is a greater distance between the nucleus and the outermost orbital. This results in larger atomic radius.

## D. IONISATION ENTHALPY

The minimum amount of energy which is needed to remove the most loosely bound electron from a neutral isolated gaseous atom in its ground state to form a cation also in the gaseous state.



# Factors on which ionisation enthalpy depends :-

1. Atomic size
2. Nuclear charge
3. Screening effect of inner shell electrons
4. Symmetry of electronic configuration



# Variation of ionisation enthalpy in periodic table:-

## Variation along a period:-

Ionisation enthalpies of elements increases from left to right.

**Explanation:** Ionization enthalpy generally increases from left to right across a period in the periodic table because the effective nuclear charge increases, while the atomic size decreases. This means the outermost electrons are held more tightly by the nucleus, requiring more energy to remove them.

## Variation down a group :-

Ionisation enthalpies of elements decreases on moving top to bottom.

**Explanation:** Ionization enthalpy generally decreases as you move down a group in the periodic table because the outermost electron is further from the nucleus and experiences a greater shielding effect from inner electrons. This reduced attraction between the nucleus and the valence electron makes it easier to remove, requiring less energy



**THANK YOU**