Nishant Jindal

Diagonal relationship

Ionic potential

(ϕ) Charge density $= \dfrac{\text{charge}}{\text{size}}$

those element which have similar Ionic potential can show diagonal relationship

Li	Be	B	C
Na	Mg	Al	Si

Nishant Jindal

Representative element $\Rightarrow$ s and p - Block element are called except Noble gas

typical element $\Rightarrow$ 3rd period element

Nishant Jindal

transition element = d-block element which have partial filled d-subshell in G.S or in stable oxidation state.

${}_{29}Cu = 1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 4s^1\ \underline{3d^{10}}$

$Cu^{+} = 1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^{10}$

$\underline{Cu^{+2}} = 1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^6\ 3d^9$

Nishant Jindal

$_{30}Zn = 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10}$

$Zn^{+2} = 1s^2 2s^2 2p^6 3s^2 3p^6 \underline{3d^{10}}$

$\left\{ \begin{matrix} Zn \\ Cd \\ Hg \end{matrix} \right\} \rightarrow$ d-Block element but not transition element

Nishant Jindal

Inner transition element $\Rightarrow$ f-Block element

trans Uranic element

$\underset{90}{Th}$ $\underset{91}{Pa}$ $\underset{92}{U}$ → natural radioactive element

Synthetic (man made element)

after 92 (Uranium) are called trans Uranic

$[{}_{93}Np \longrightarrow \underset{103}{Lr}]$

bridge element ⇒ 3^{rd} period element are Called bridge element

$3s^1$
Na
Cu — K
$4s^1$ $4s^1$

$3s^2$
Mg
Ca — Zn
$4s^2$ $4s^2$

Nishant Jindal

group / Period / Block identification in d-Block

$_{26}Fe = 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^6$

highest Q.N = 4

group = number of ns e^- + number of (n-1)d e^-

= 2 + 6

VIII / 8 group

$_{21}Sc = 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^1$

Nishant Jindal

f-Block

$\underbrace{104 \text{ — } 112}$ d-Block

III B/3		
Sc	Ti	V
Y	Zr	Nb
57 La	72 Hf	Ta
89 Ac	Ku/Rf 104	Ha 105

$\left.\begin{array}{l} Ce_{58} \longrightarrow Lu_{71} \\ Th_{90} \longrightarrow Lr_{103} \end{array}\right\}$ f-Block

Nishant Jindal

IA

Li
Na
K
Rb
Cs
Fr

alkali metals

IIA

Be → not alkaline earth metal

Mg
Ca
Sr
Ba
Ra

alkaline earth metal

113
114
115
116
117
118

Nishant Jindal

Boron family	Carbon	(Choking) Pnicogen family	Chalcogen ore forming family	Halite Halogen family	(Noble gas)
B	C	N	O	F	He
Al	Si	P	S	Cl	Ne
Ga	Ge	As	Se	Br	Ar
In	Sn	Sb	Te	I	Kr
Tl	Pb	Bi	Po	At	Xe
					Rn

Nishant Jindal

Periodic properties

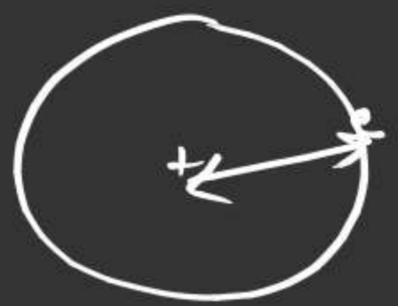
1. Atomic radii
2. Ionisation energy (I.E) | (I.P) Ionic potential
3. electron gain enthalpy ΔH_{eg} | electron affinity (E.A)
4. Electronegativity (E.N)

H.W

$\boxed{\text{Sheet + NCERT}}$

Nishant Jindal

Atomic radii



distance of outershell e^- from nucleus is called atomic radii

<u>Note</u> ⇒ we can not measure atomic radii because atom does not have certain boundary

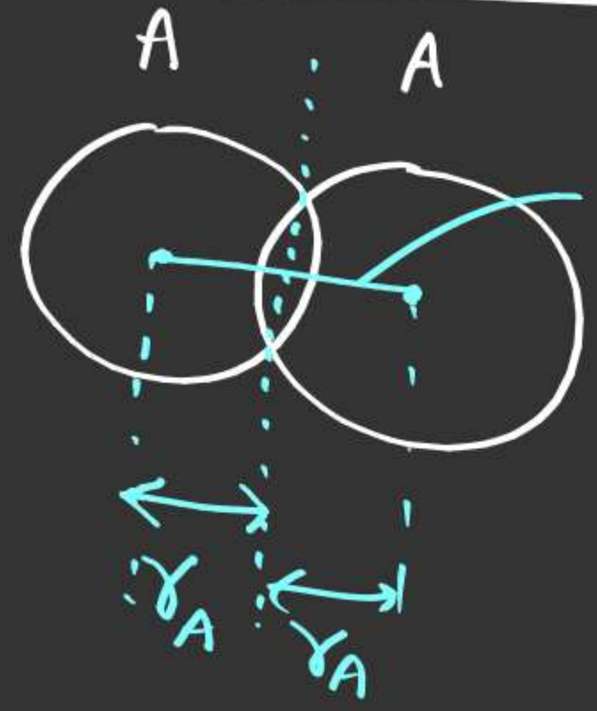
Nishant Jindal

type of Atomic radii

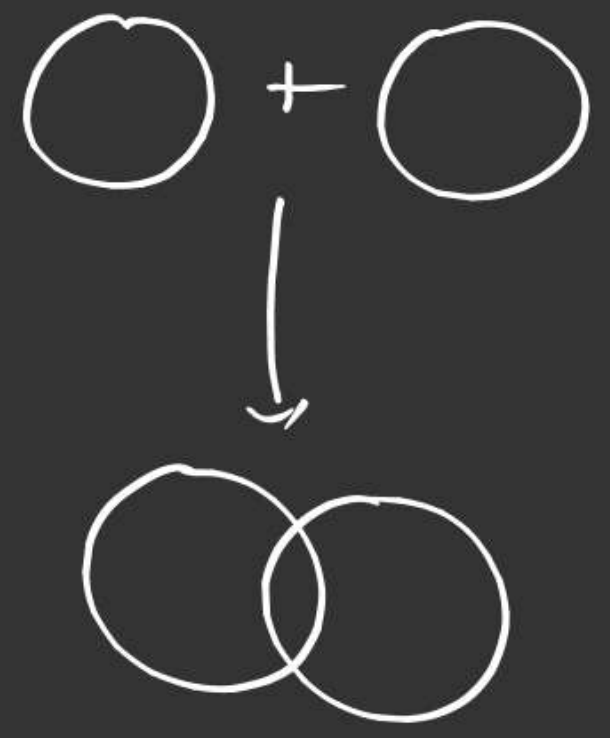
1. Covalent radii
2. metallic radii
3. Ionic radii
4. V.W.R [vanderwaal radii

Covalent radii

(a) Homonuclear diatomic molecule



d_{A-A} (Internuclear distance
Bond length



$$d_{A-A} = r_A + r_A$$

$$d_{A-A} = 2r_A$$

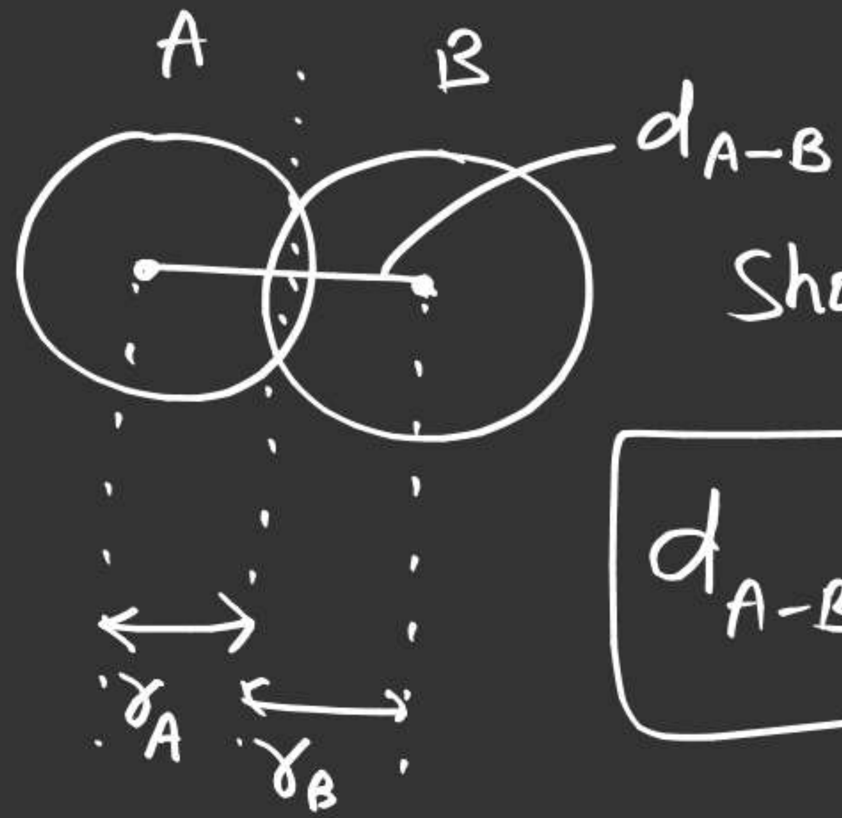
$$\star\ \boxed{r_A = \frac{d_{A-A}}{2}}$$

Nishant Jindal

Que find the r_{Cl} if d_{Cl-Cl} is $1.98\,Å$

Nishant Jindal

Hetereo nuclear diatomic molecule



Showmaker and stevensen

$$\boxed{d_{A-B} = \gamma_A + \gamma_B - 0.09|\Delta x|}\ \underline{A^\circ}$$

Δx = diff. of Electronegativity (E.N)

$$\boxed{1 A^\circ = 10^2 pm}$$

Nishant Jindal

E.N

$\overset{+\delta}{A} \longrightarrow \overset{-\delta}{B}$

2.1 H

Li 1   Be 1.5   B 2   C 2.5   N 3   O 3.5   F 4

Cl 3

{tendency to attract shared paired e^-}