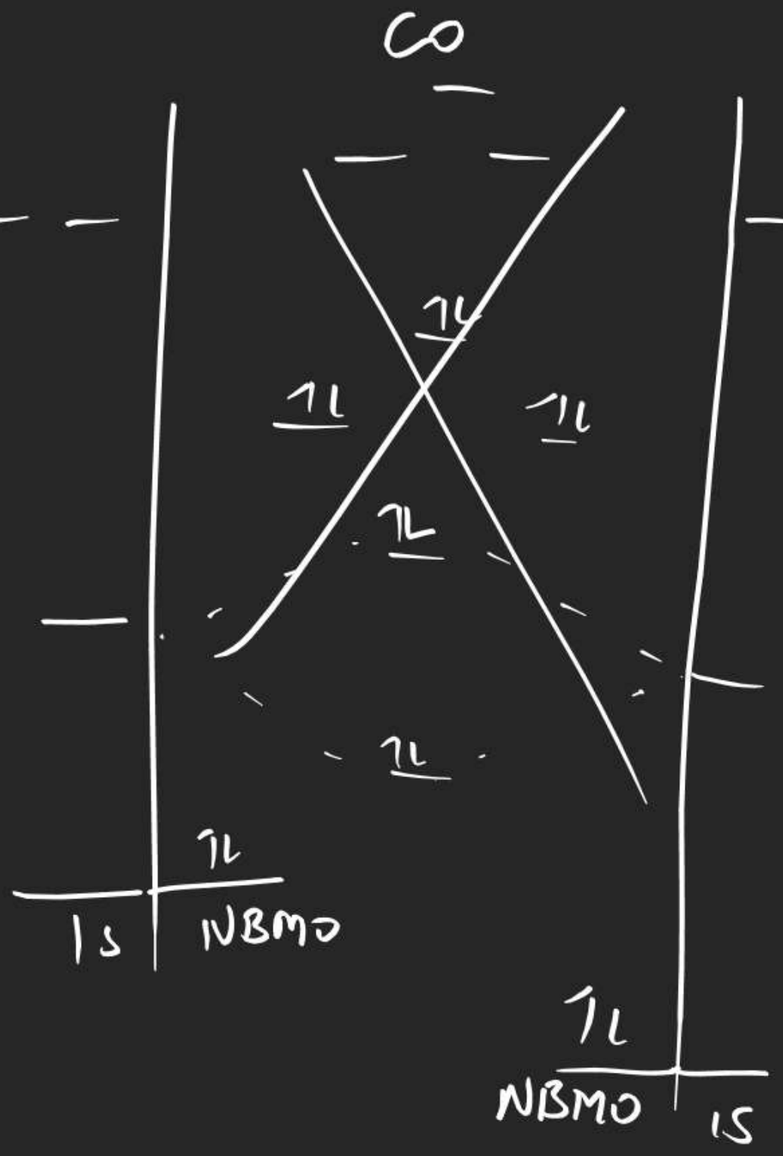
Nishant Jindal

Heteronuclear diatomic molecule



$CO \longrightarrow CO^+$

CO^+

2.5

B.O = 3

$= 1.128\,A^\circ$

$1.1150\,A^\circ$

$B.O = \frac{1}{2}(8-2)$

$= \frac{1}{2} \times 6$

$= 3$

Nature = Dia.

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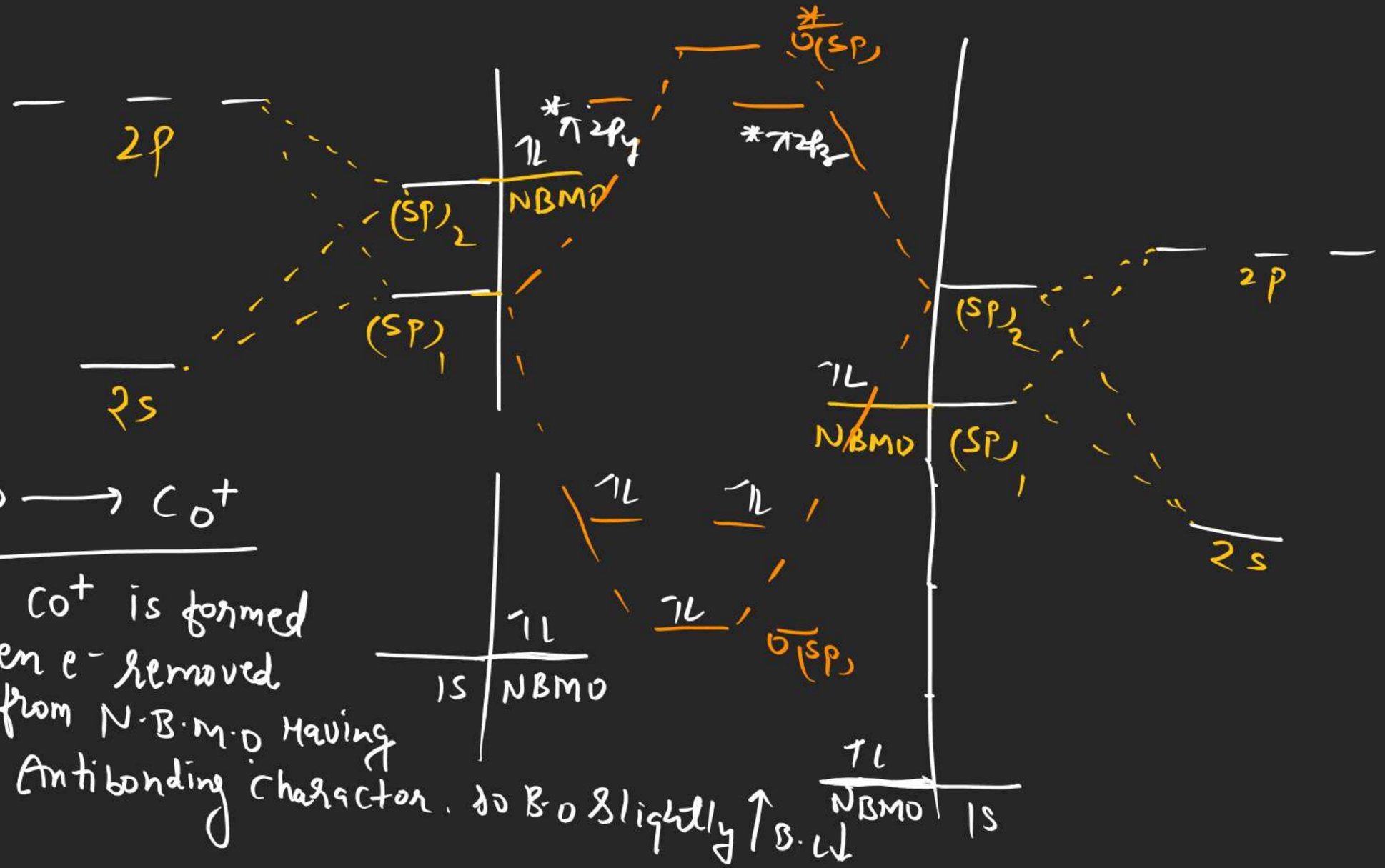
Coulson model



$C_O \longrightarrow C_O^+$

When C_O^+ is formed then e^- removed from N.B.M.O Having Antibonding Character. so B.O Slightly ↑ S.L

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Q. Find the number of π bonds in B_2 and C_2

$$B.O = \frac{1}{2}(N_B - N_A)$$

N_B = no of B.M.O e^-

N_A = no of A.B.M.O e^-

$B_2 = \overline{\sigma(1s)}^2 \; \overline{\sigma^*(1s)}^2 \; \overline{\sigma(2s)}^2 \; \overline{\sigma^*(2s)}^2 \; \pi 2p_y^1 = \pi 2p_z^1$

$B.O = \frac{1}{2}(2-2) = 0$

$\frac{1}{2}(2-2) = 0$

$\frac{1}{2}(2-0) = 1$

B — B

one π bond

$C_2 = \overline{\sigma(1s)}^{2}\ \overline{\sigma^*(1s)}^{2}\ \overline{\sigma(2s)}^{2}\ \overline{\sigma^*(2s)}^{2}\ \pi 2p_y^2 = \pi 2p_z^2$

$\frac{1}{2}(2-2) = 0$

$\frac{1}{2}(2-2) = 0$

$\frac{1}{2}(4-0)$

$\frac{1}{2} \times 4 = 2$

C = C

two π bond

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Order of I.E

$N_2 > O_2$

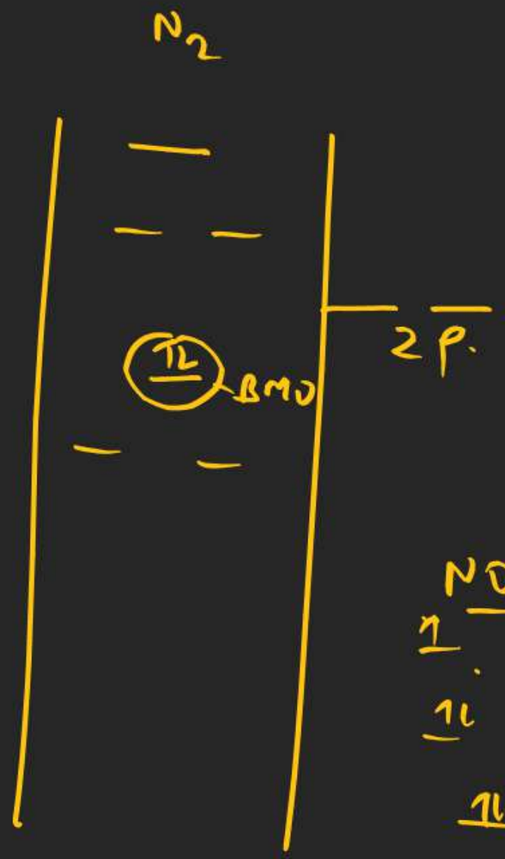
$N_2 > N$

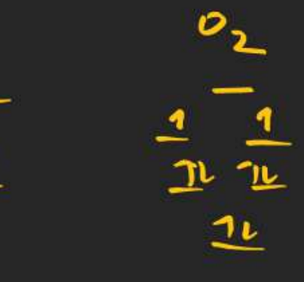
$N_2 > O$

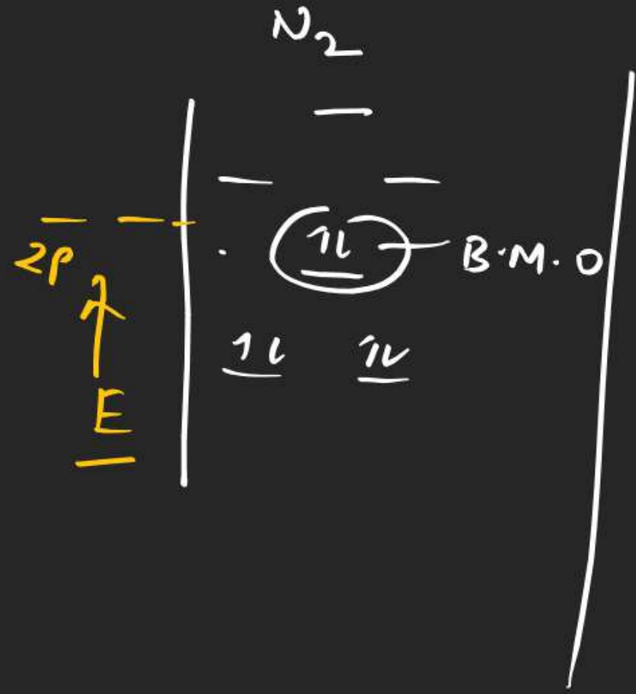
$O_2 < N$

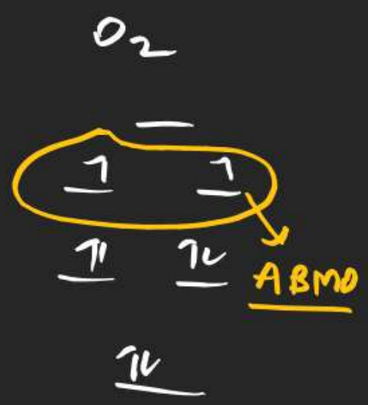
$O_2 < O$

$NO < O_2$









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Ques

F_2 = Pale yellow

Cl_2 = greenish yellow

Br_2 = Reddish Brown

I_2 = violet

Ques Halogens are Diamag. and colourful explain

Ans due to HOMO - LUMO transition.

HOMO = Highest occupied molecular orbital

LUMO = Lowest unoccupied molecular orbital.

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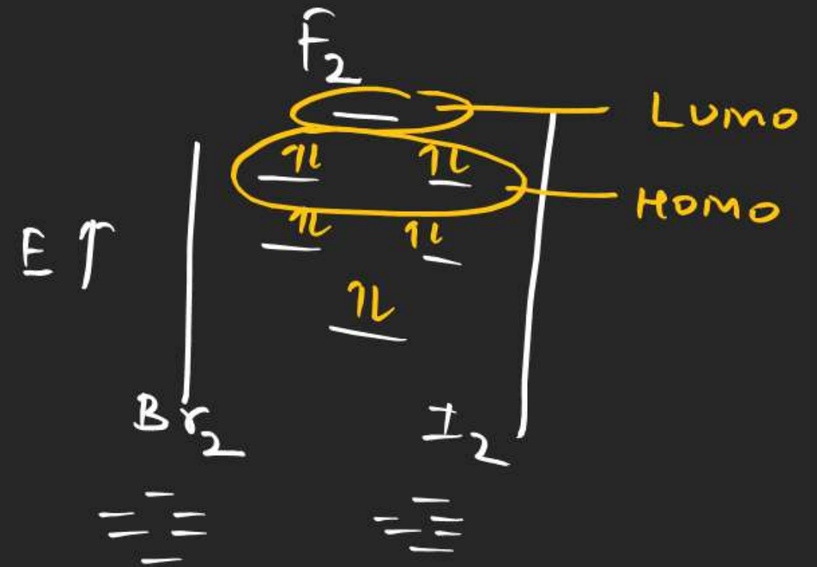

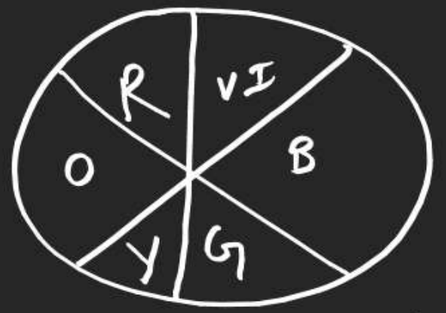

VIBGYOR

$\uparrow \nu \downarrow E \downarrow$

$\downarrow E = \frac{hc}{\lambda \uparrow}$

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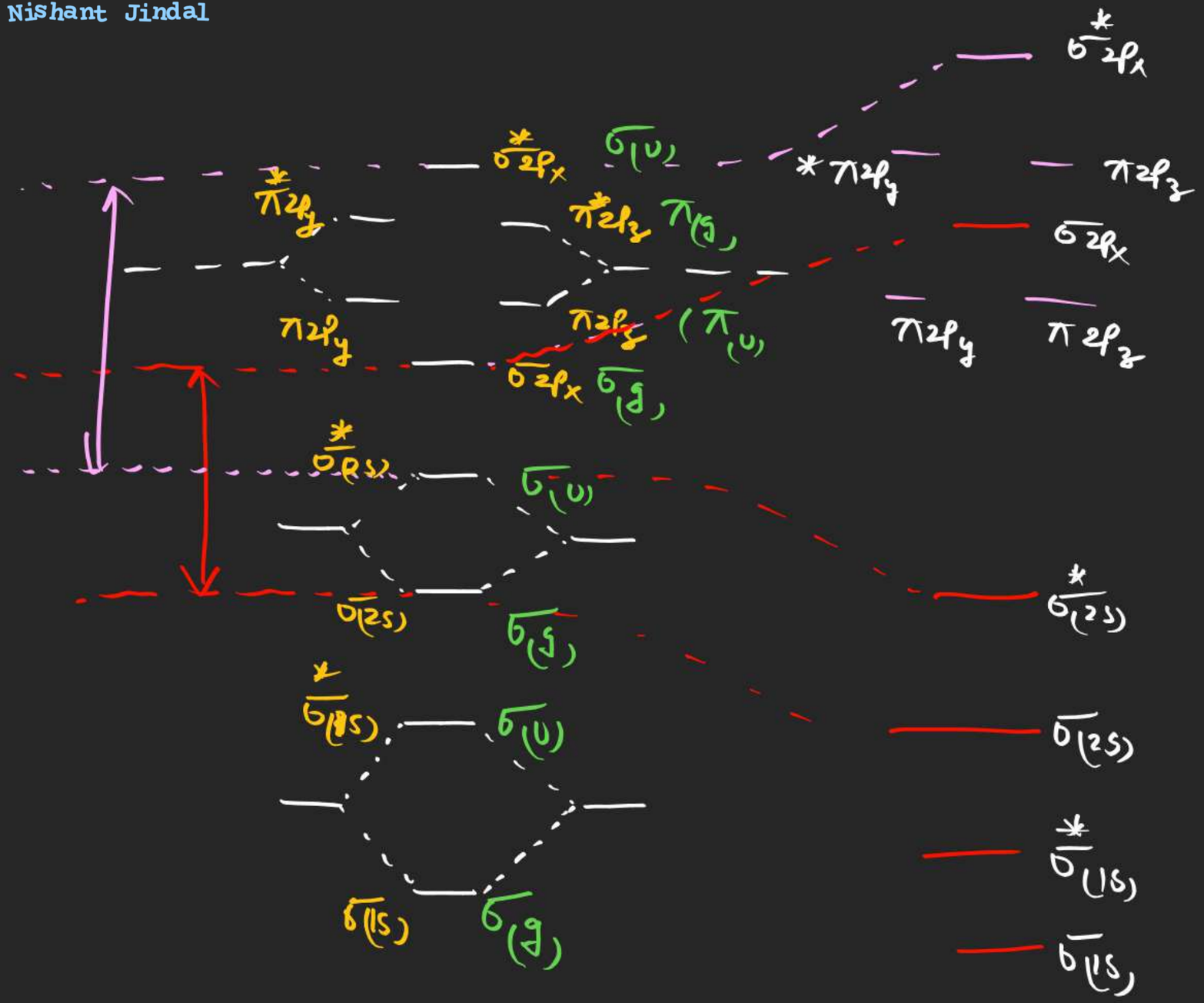

non crossing theory of M.O

Same symm orbital repel each other.

B_2 C_2 N_2 [sp mixing dia.

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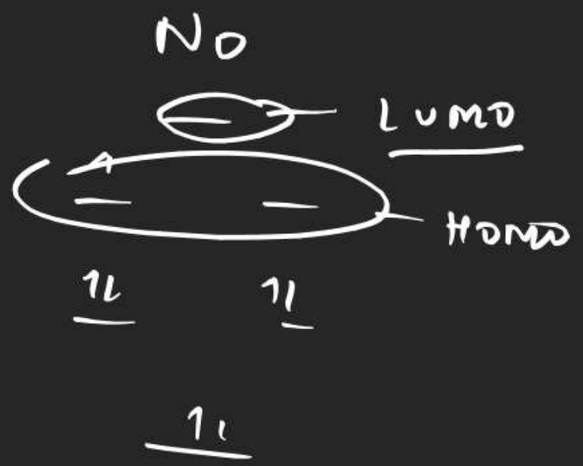

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	N_2	O_2^{+2}	NO^+	$C\bar{N}$	CO
B.O =	3	3	3	3	3

	NO	N_2^-	O_2^+
B.O =	2.5	2.5	2.5

	O_2^{-2}	N_2^{-2}	NO^-
B.O =	2	2	2

Keypoint ⇒ isoelectronic molecule have same bond order

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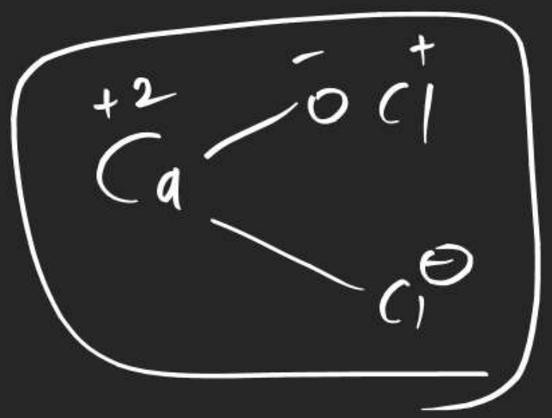

B.O = number of Bonds between two atoms

H—H B.O = 1

O=O B.O = 2

$B.O = \frac{1}{2}(N_B - N_A)$

N_B = no of e^- in B.M.O e^-

N_A = no of e^- in A.B.M.O e^-

He_2	Be_2	Ne_2
B.O = 0	0	0

B.O becomes tive -ive zero fractional.

Note ⇒ if B.O becomes zero or -ive then molecule donot exist.

If B.O becomes fractional then molecule it self unstable but relatevely it is more stable then other

	O_2	NO
B.O =	2	2.5