NO_2^-

$n_1 = 5 + 2 \times 6 + 1$

$= 18$

$n_2 = 8 \times 3$

$= 24$

$n_3 = 24 - 18 = 6$

$= \frac{6}{2} = 3$ [no of bonds]

$n_4 = n_1 - n_3$

$= 18 - 6 = 12$

$= \frac{12}{2} = 6$ [no of lone pair]

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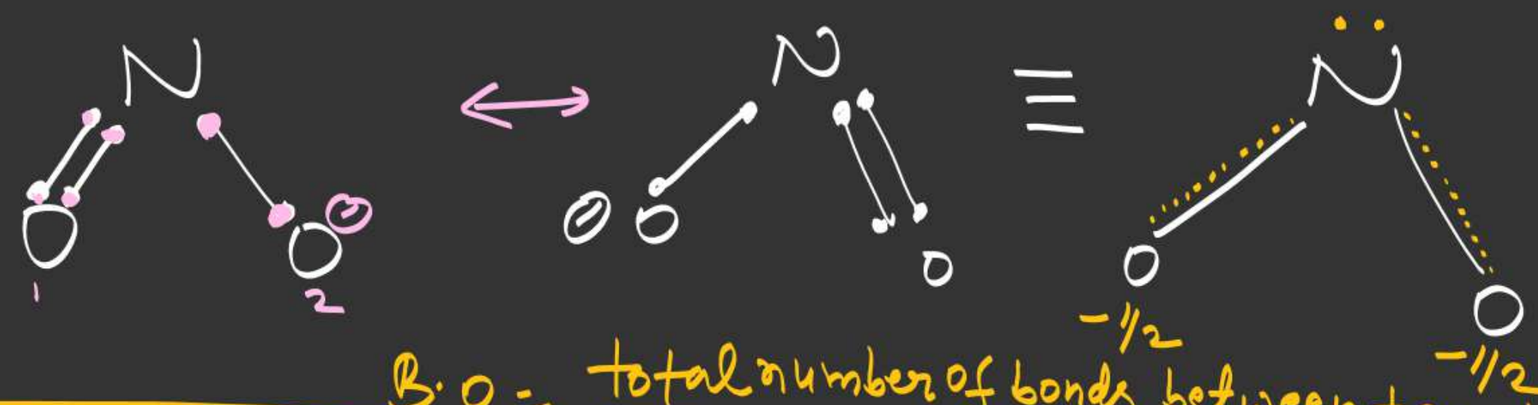

$$B.O = \frac{\text{total number of bonds between two atoms in all R.S}}{\text{total R.S}}$$

$$= \frac{3}{2} = 1.5$$

NO_2^- have same b.L η_{N-O}

$$f.c = V - \frac{S}{2} - U$$

$$f.c \text{ on } N = 5 - \frac{6}{2} - 2$$

$$= 0$$

$$f.c \text{ on } O_{(1)} = 6 - \frac{4}{2} - 4$$

$$= 0$$

$$f.c \text{ on } O_{(2)} = 6 - \frac{2}{2} - 6$$

$$= -1$$

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NO_3^-

$n_1 = 5 + 3\times 6 + 1$

$= 24$

$n_2 = 8\times 4$

$= 32$

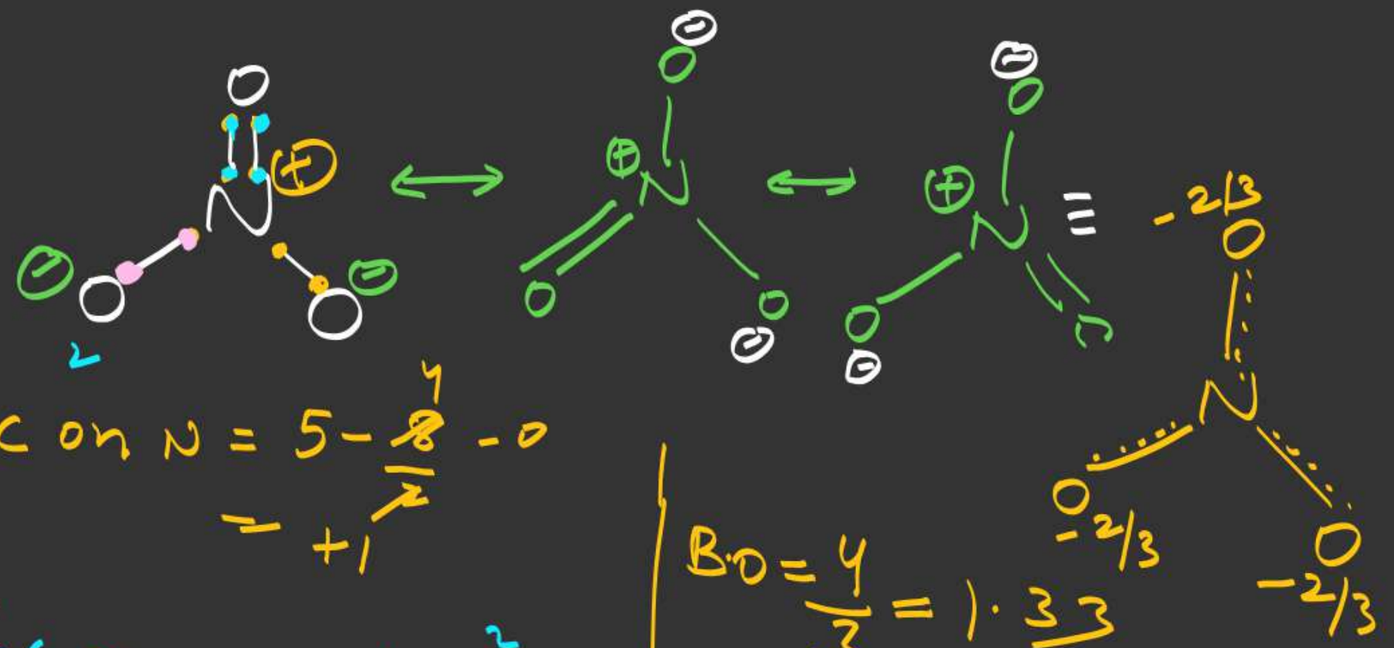
$n_3 = 32 - 24 = 8$

$\frac{8}{2} = 4$ [no π bonds]

$n_4 = n_1 - n_3$

$= 24 - 8 = 16$

$= \frac{16}{2} = 8$ [no n.l.p]



f.c on N $= 5 - \frac{8}{2} - 0$

$= +1$

f.c on O $= 6 - \frac{2}{2} - 4$

$= 0$

f.c $_2$O $= 6 - \frac{2}{2} - 6$

$= -1$

B.O $= \frac{4}{3} = 1.33$

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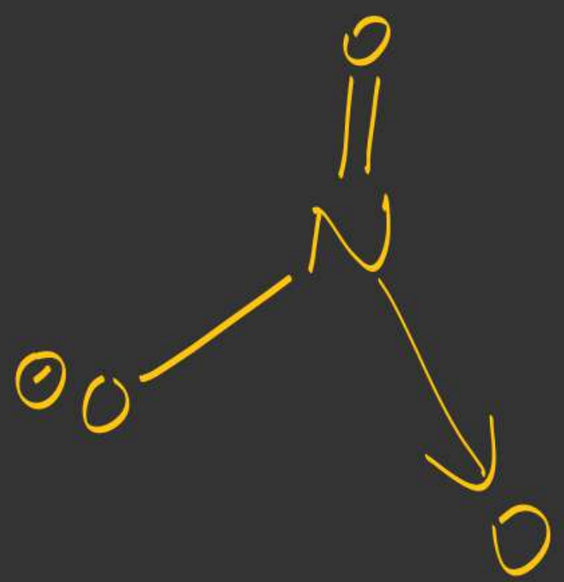

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NH_4^+

$n_1 = 5 + 4 - 1$

$= 5 + 3$

$= 8$

$n_2 = 2 \times 4 + (8 \times 1)$

$= 8 + 8$

$= \underline{16}$

$n_3 = 16 - 8 = 8$

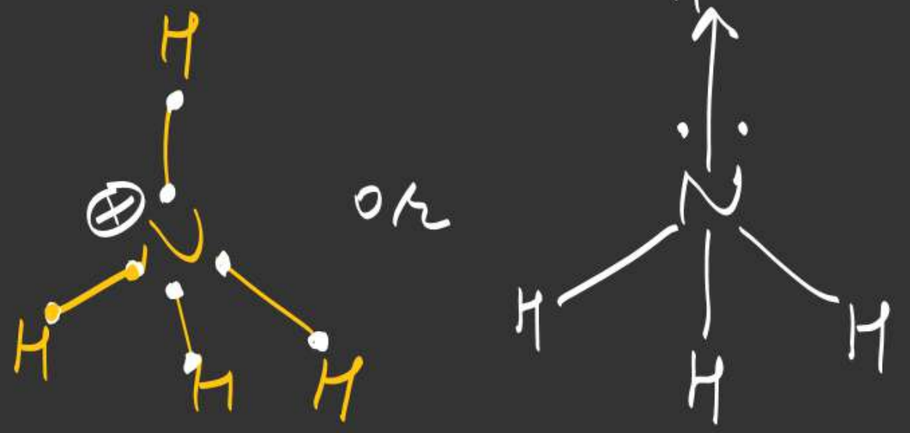
$= 8$

$\frac{8}{2} = 4$ (coordinate bonds)

$n_4 = n_1 - n_3$

$= 8 - 8$

$= 0$



f.c on $\underline{N} = 5 - \frac{8}{2} - 0$

$= +1$

CO

$n_1 = 4 + 6$

$= 10$

$n_2 = 8 \times 2$

$= 16$

$n_3 = 16 - 10$

$= \frac{6}{2} = 3$ (no of bonds)

$n_4 = n_1 - n_3$

$= 10 - 6$

$= \frac{4}{2} = (\text{no of lp})$

$\therefore$

f.c on $C = 4 - \frac{6}{2} - 2$

$= -1$

f.c on oxygen $= 6 - \frac{6}{2} - 2$

$= +1$

B.O = number of bonds

B.O ↑ att: ↑ B.L ↓

Ans order of B.L of N–O Bond in NO_2^- and NO_3^-

– NO_2^- B.O = 1.5

NO_3^- B.O = 1.33

B.O ↑ B.L ↓

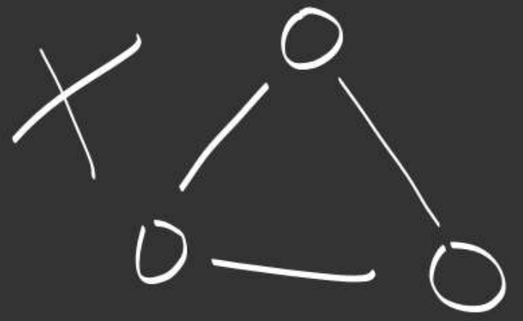
d_{N-O} of $NO_2^- < d_{N-O}$ of NO_3^-

O_3

$n_1 = 6+6+6$
$= 18$

$n_2 = 3 \times 8$
$= 24$

$n_3 = 24 - 18 = 6$
$= \frac{6}{2} = 3$ (no. of bonds)



(3 memb. Ring unstable)

$n_4 = n_1 - n_3$
$= 18 - 6 = 12$
$= \frac{12}{2} = 6$ (no. of l.p.)

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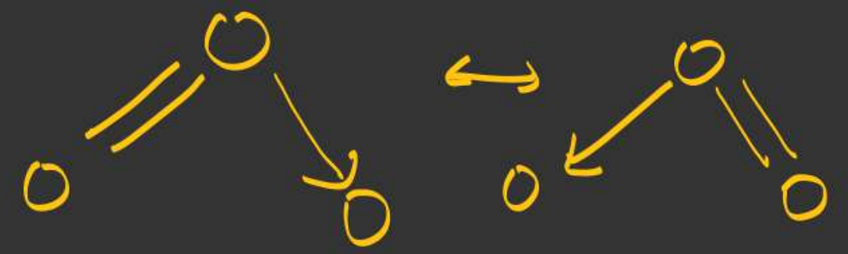
$$f.c\ \underset{3}{O} = 6 - \frac{1}{2}\times 2 - 6$$

$$= -1$$



$$f.c\ on\ \underset{(1)}{O} = 6 - \frac{2}{2} - 4$$

$$B.O = \frac{3}{2} = 1.5$$

$$f.c\ on\ \underset{2}{O} = 6 - \frac{4}{2} - 2$$

$$= 1$$

In O_3 O–O B.L is identical due to Resonance

Co-ordinate bond :— it is formed by unequal sharing of e-

$A \overset{\cdot\cdot}{\longrightarrow} B$

or

Bond order [B.O] = number of covalent bond between two atoms

H — H

B.O = 1

O = O

B.O = 2

N ≡ N

B.O = 3

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OR

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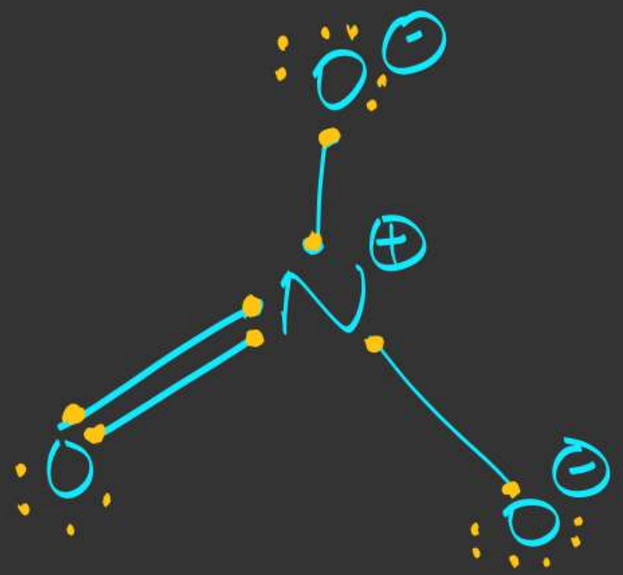

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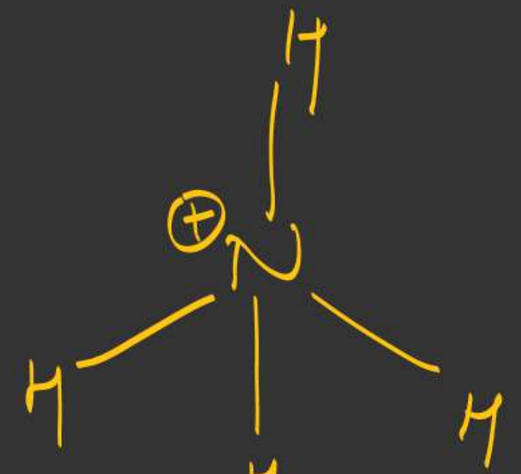

Keypoint

Maximum Valency	2	3	4	3	2	1
	Be	B	C	N	O	F
Maximum valency	2	3	4	5	6	7
	Mg	Al	Si	P	S	Cl

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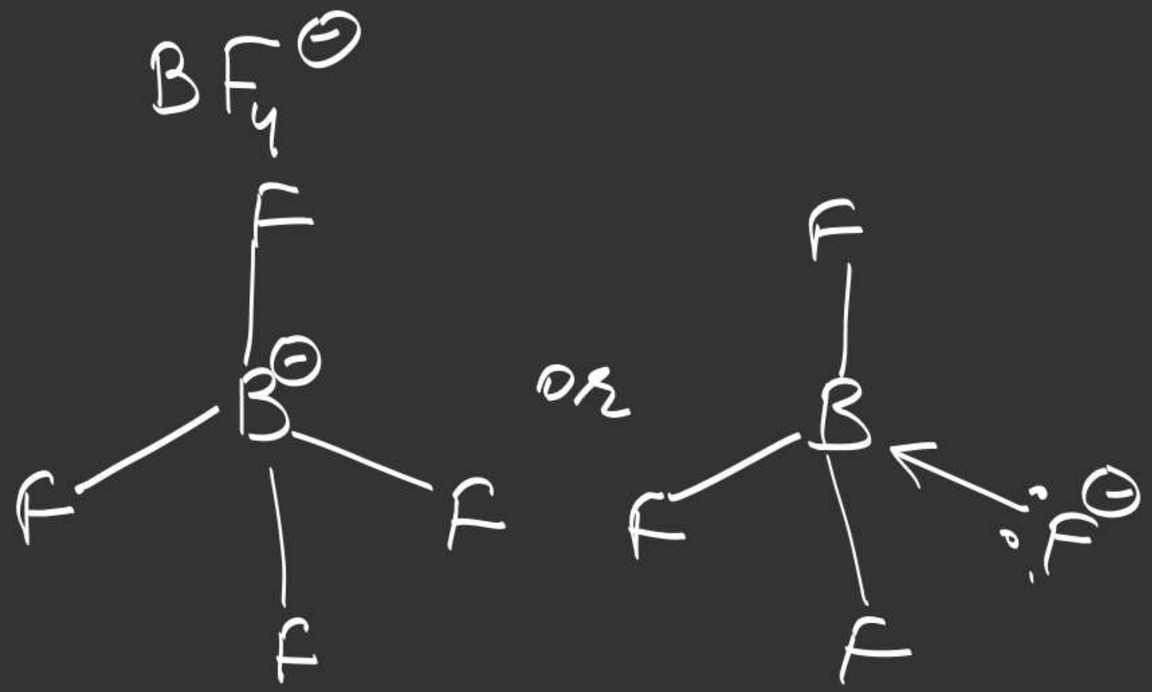

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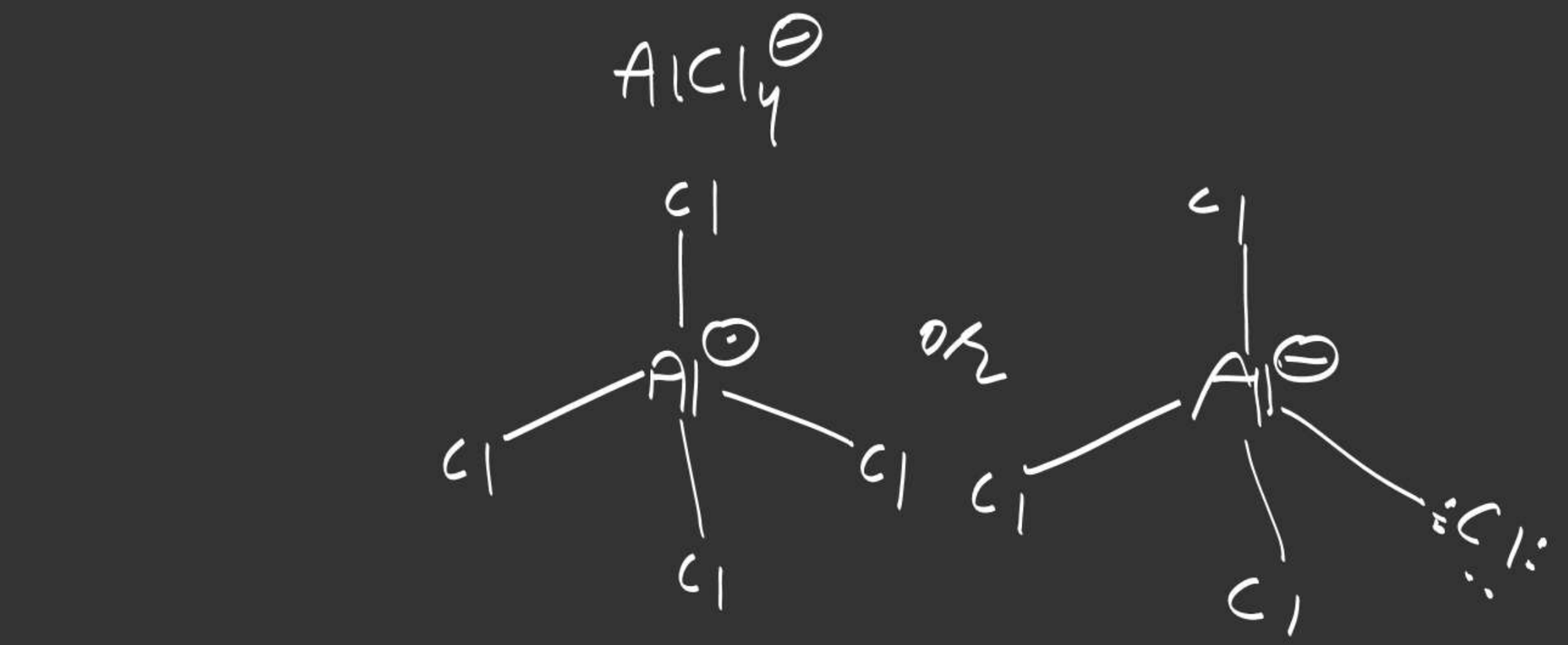

$A \longrightarrow B$

or $A^{\oplus} - B^{\ominus}$

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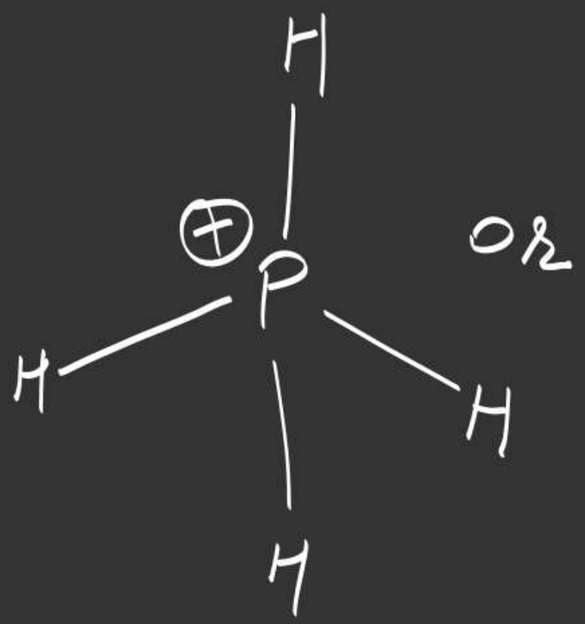
PH_4^+



or

$p = 3, 5$

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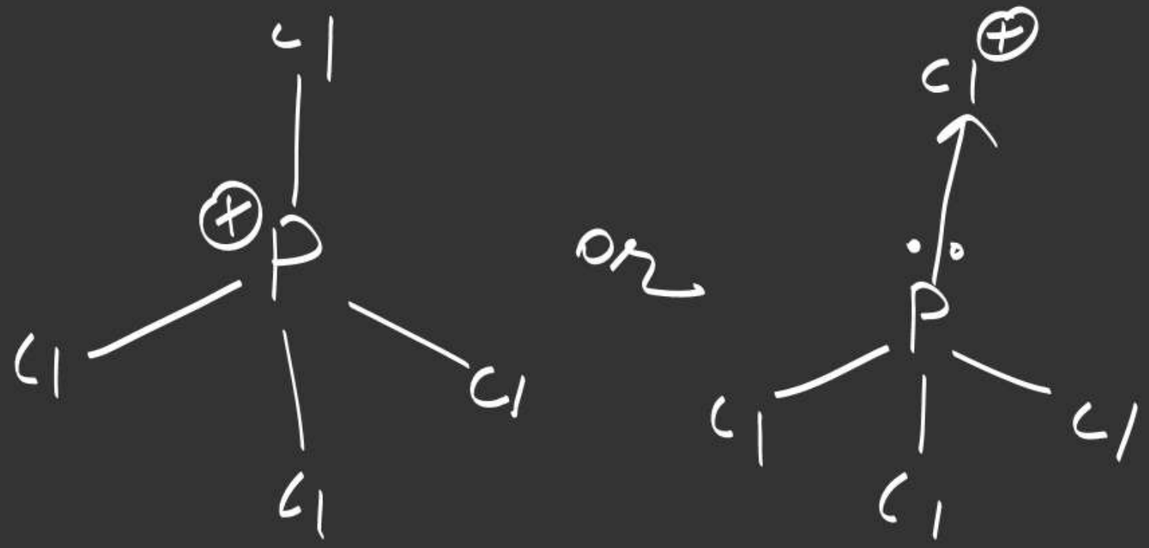
$PCl_4^{\oplus}$



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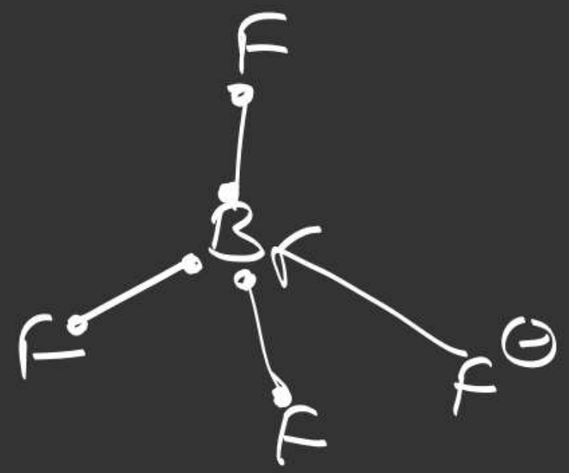

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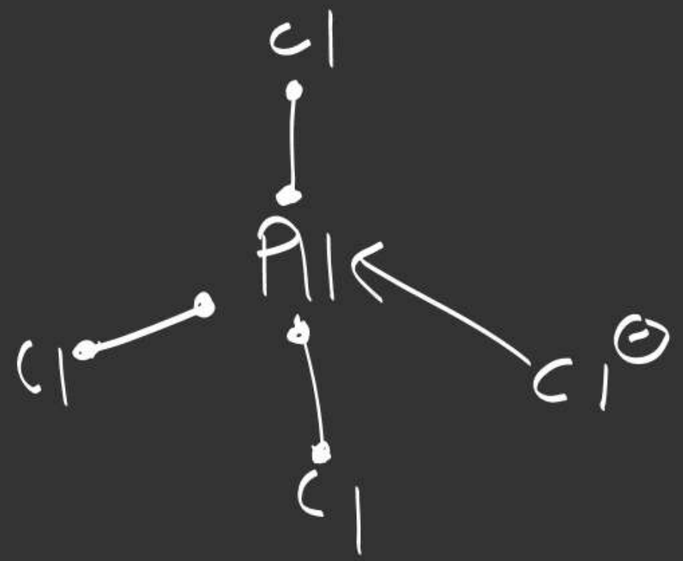
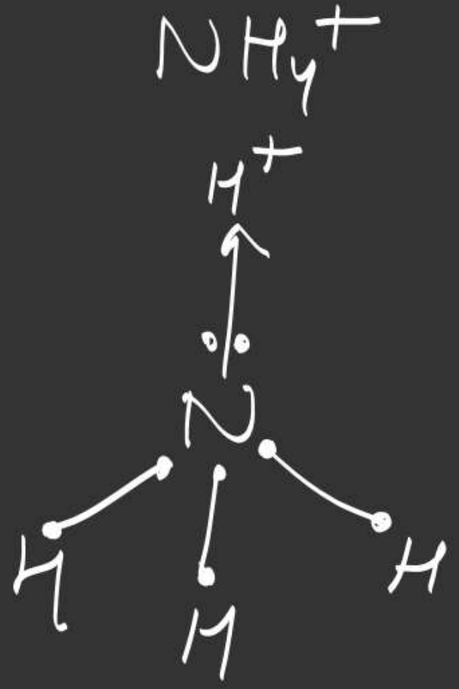
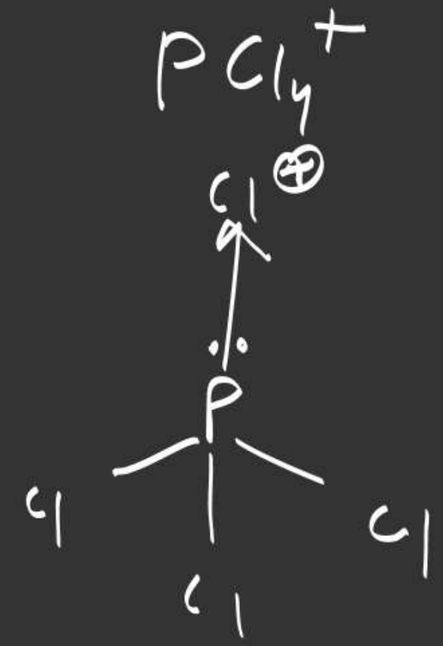
$AlCl_4^{\ominus}$



Nishant Jindal



Nishant Jindal



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$N_3^{\ominus}$ (Azide)

$n_1 = 5 \times 3 + 1$

$= 16$

$n_2 = 3 \times 8$

$= 24$

$n_3 = 24 - 16 = 8$

$= \frac{8}{2} = 4$ (no of bonds)

$n_4 = n_1 - n_3$

$= 16 - 8$

$= 8$ (no of l.p)