Nishant Jindal

CHEMICAL BONDING

Bent's Rule

more E.N ⟶ less S/C character

l.p and multiple bond ⟶ S.↑

Note ⇒ l-p has slightly more S.
than multiple

Keypoint ⇒ S.↑ B.A↑ B.L↓

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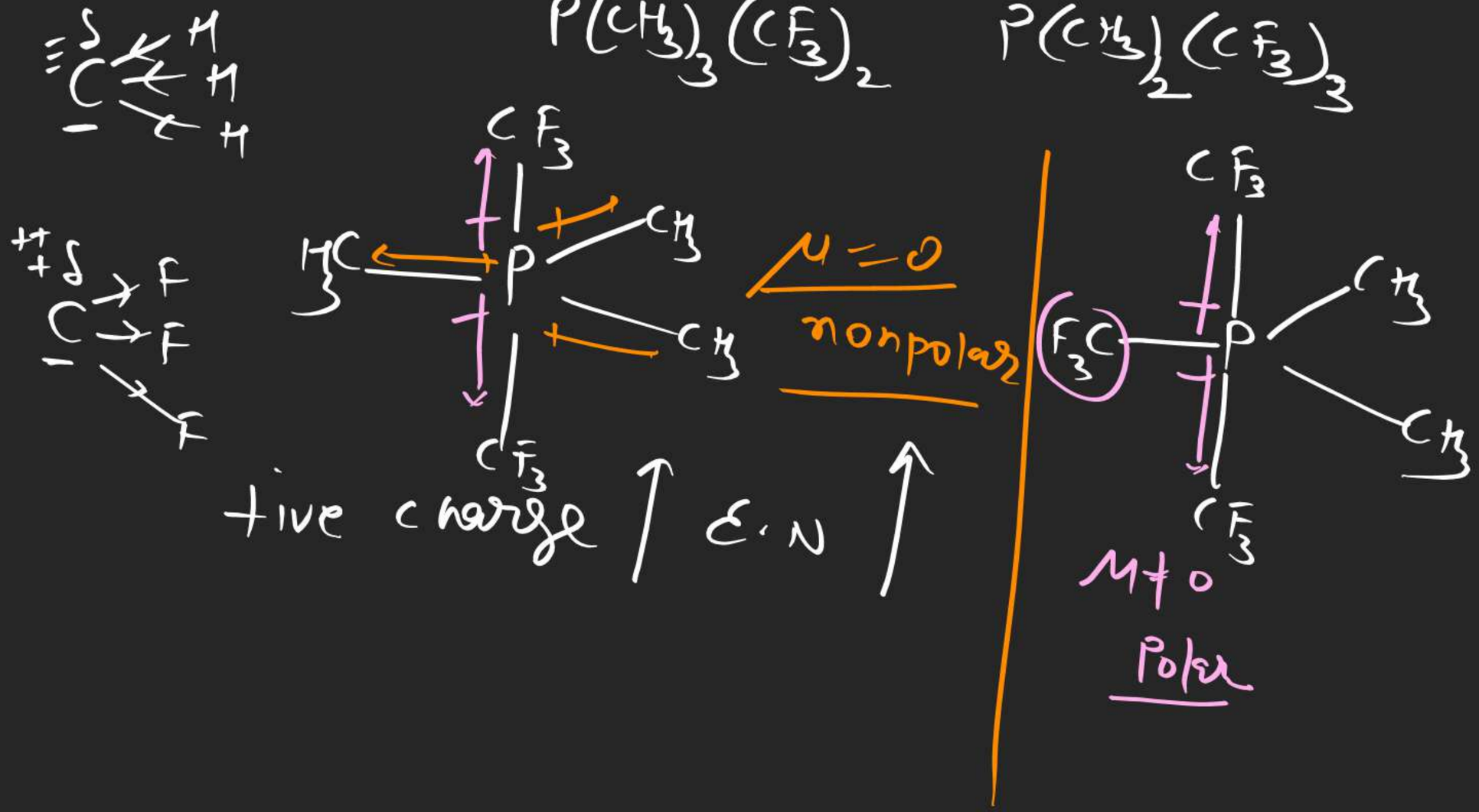
and Compare dipole moment of

$P(CH_3)_3(CF_3)_2$ $P(CH_3)_2(CF_3)_3$



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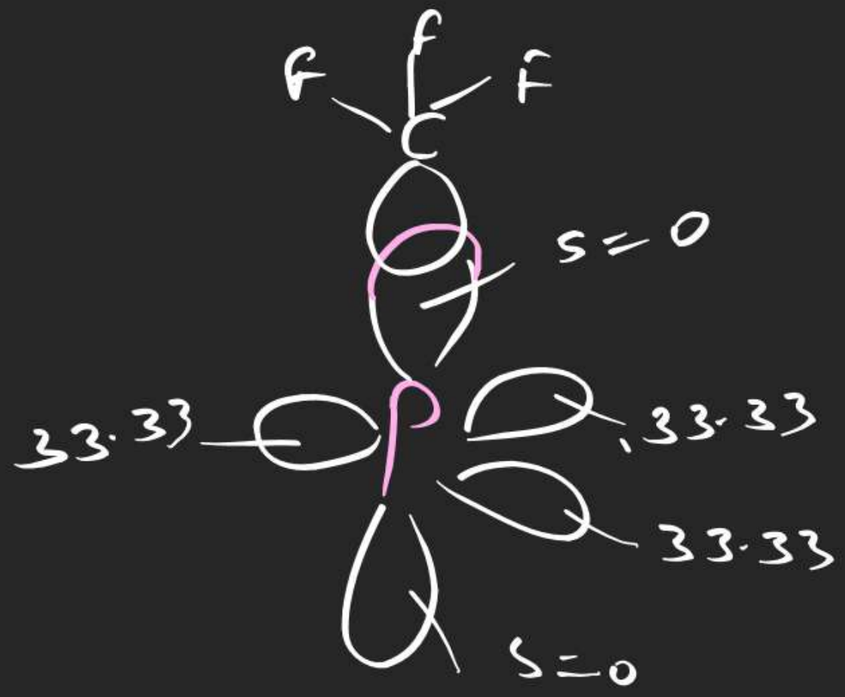
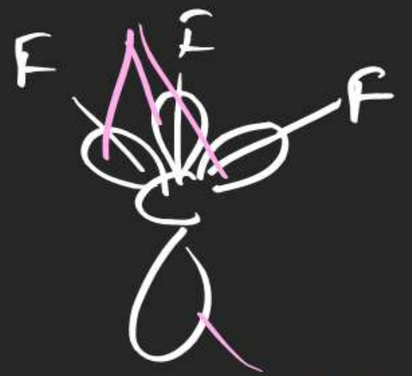


s% < 25-1.



s% > 25

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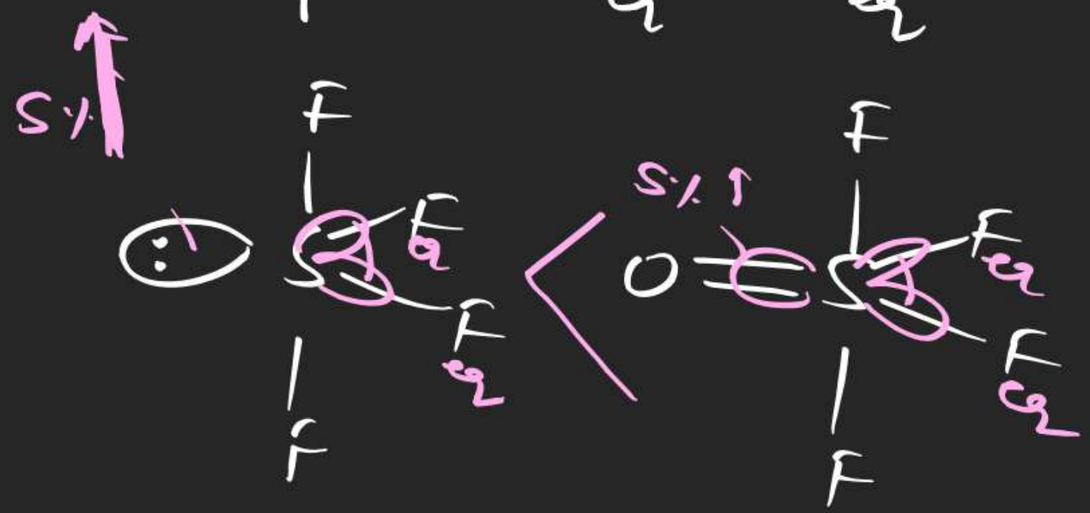
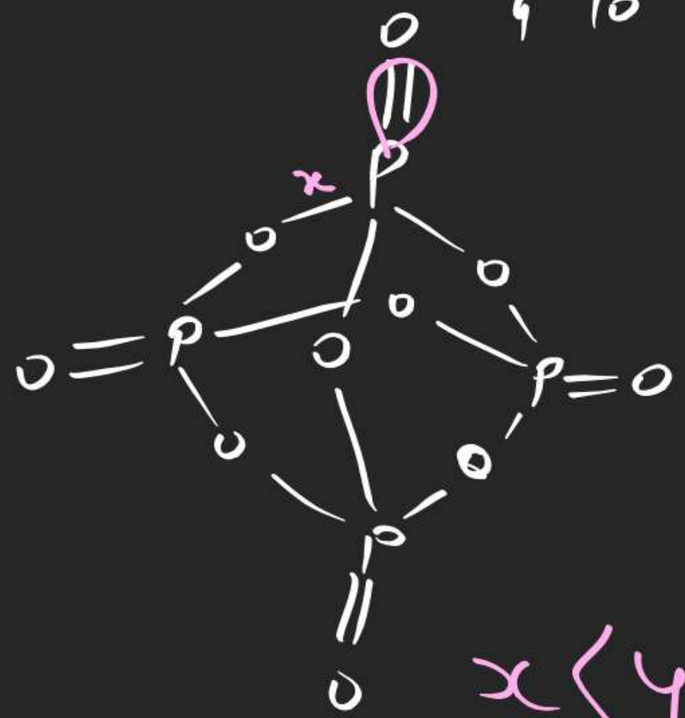
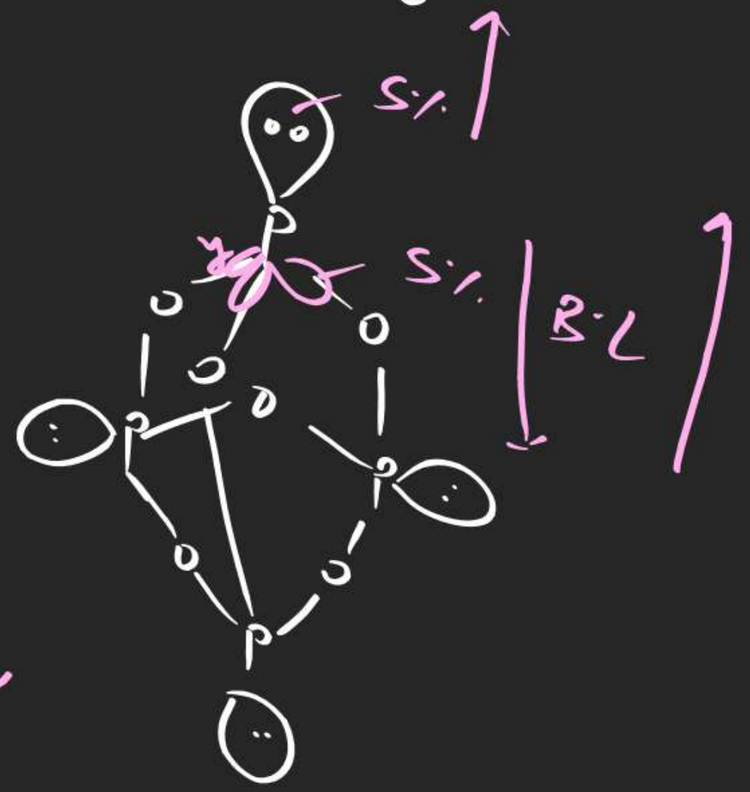
Compare $F_{eq}-\overset{\uparrow}{S}-F_{eq}$ in SF_4 and SOF_4



Qus Compare P–O B.L in P_4O_{10} and P_4O_6





$x < y$

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Que Compare N—N B.L in N_2H_4 and N_2F_4

$x > y$

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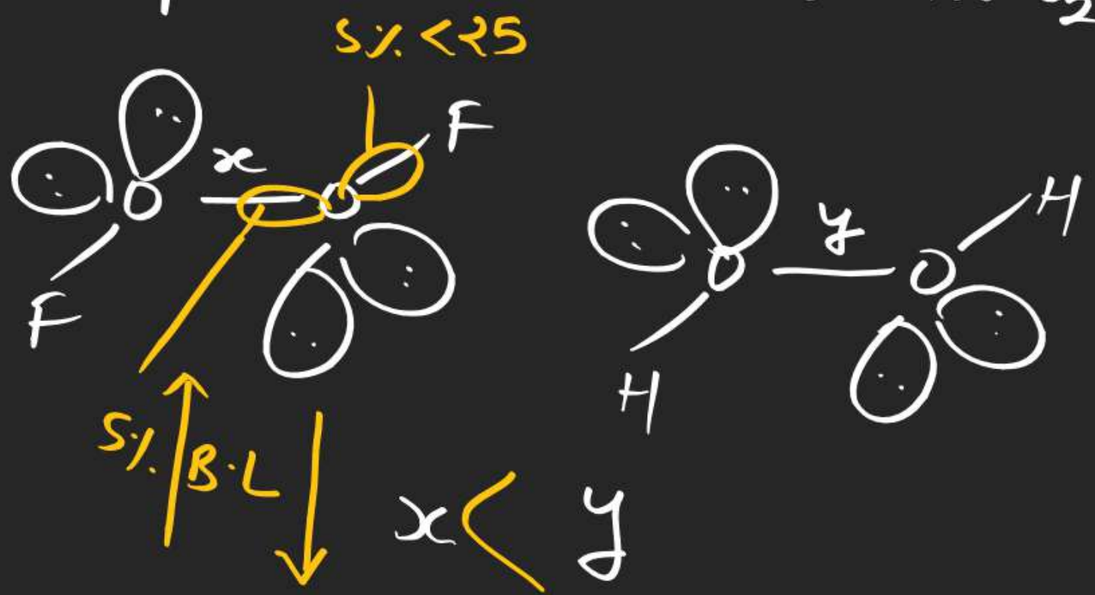
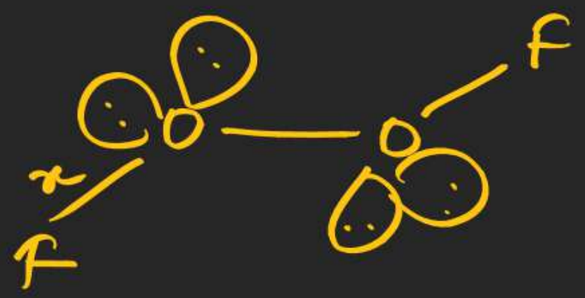
Compare O—O B.L in O_2F_2 and H_2O_2



one

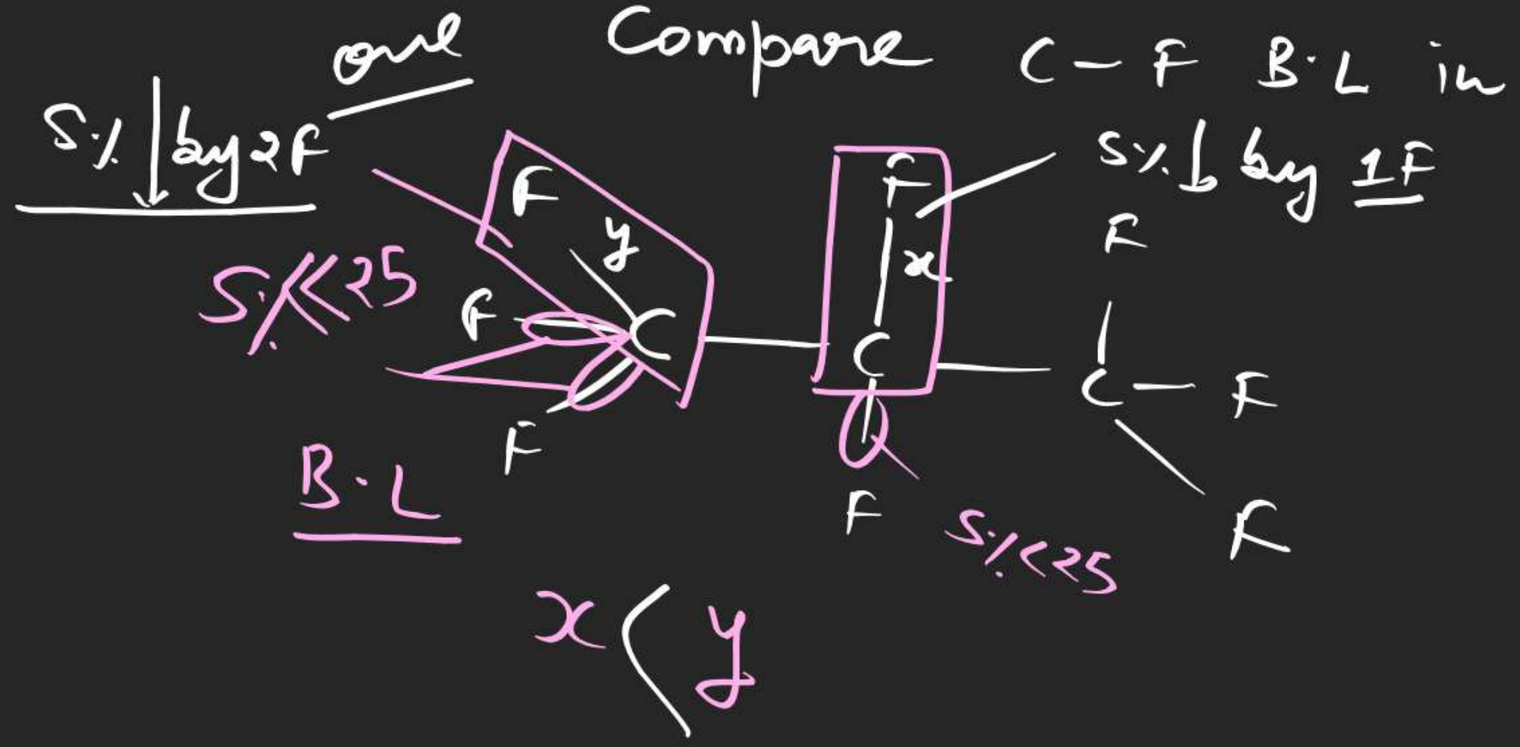


order of B.L

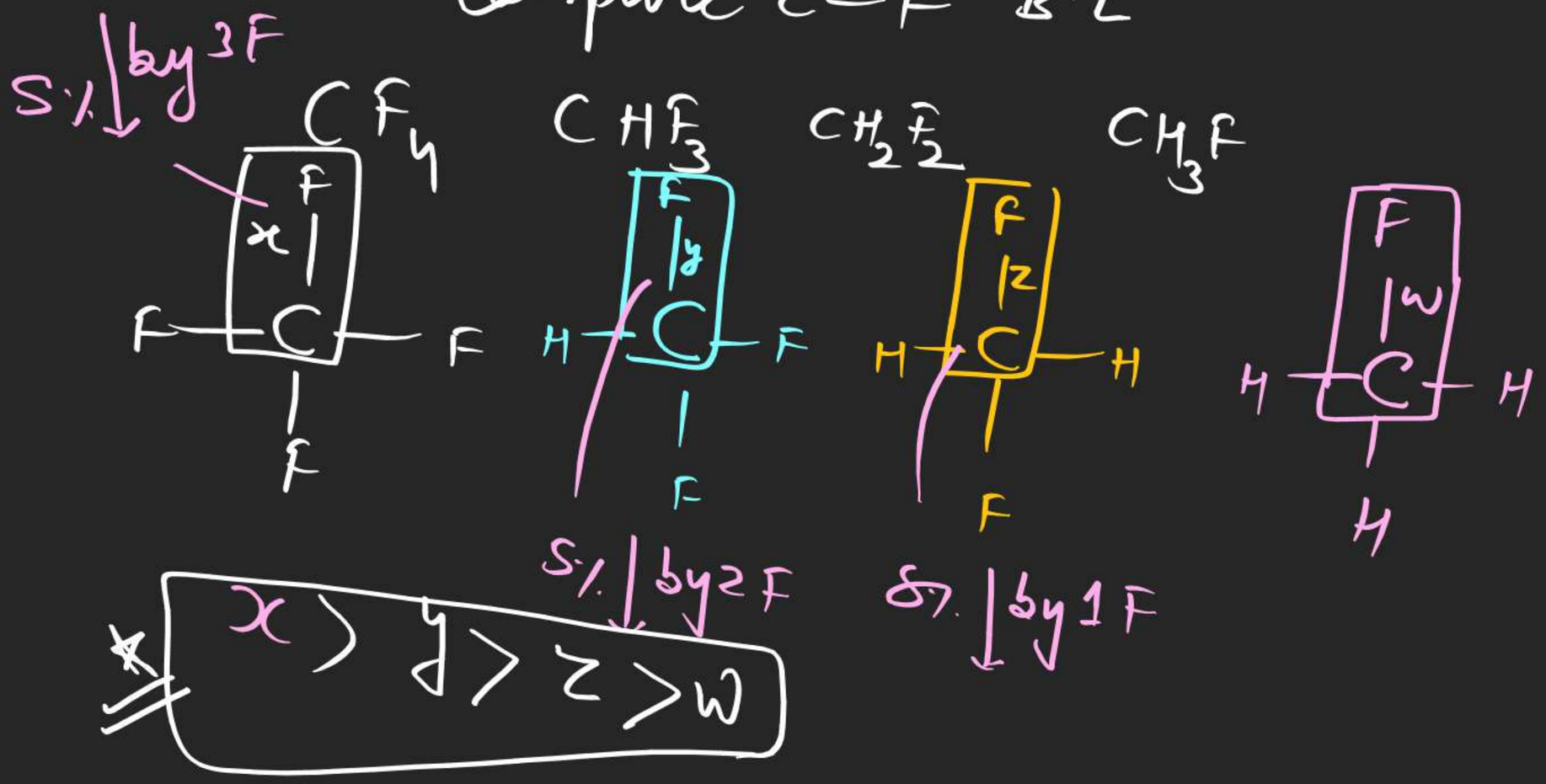
S.I. > 25

$x > y$

S.I. ↑ B.L ↓



Compare C–F B.L



MCQ

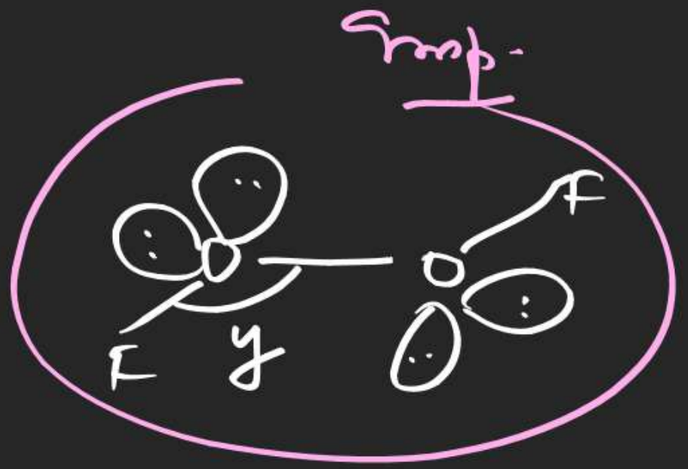
Imp one Select the Correct statement about PCl_3F_2

(1) axial P–F B.L > eq P–Cl B.L

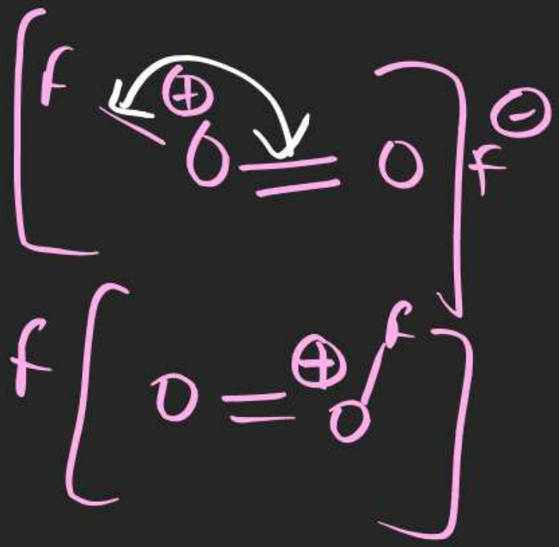
(2) axial P–F B.L < eq P–Cl B.L

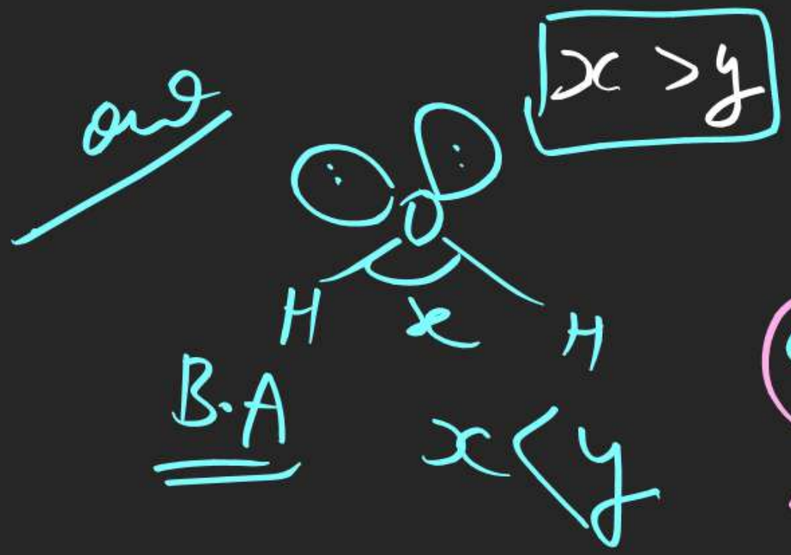
(3) axial Hybrid orbital length < eq Hybrid orbital length

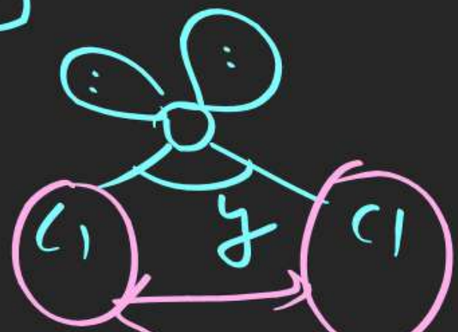
(4) axial Hybrid orbital length > eq hybrid orbital length

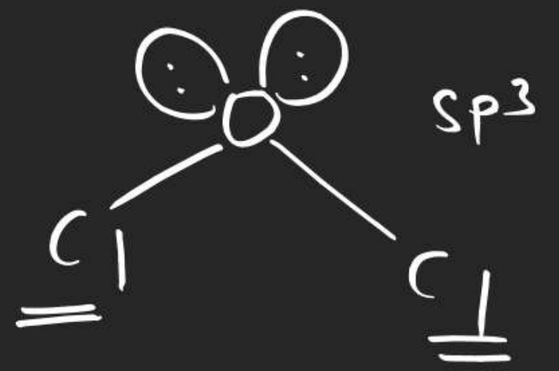


B.A $x < y$









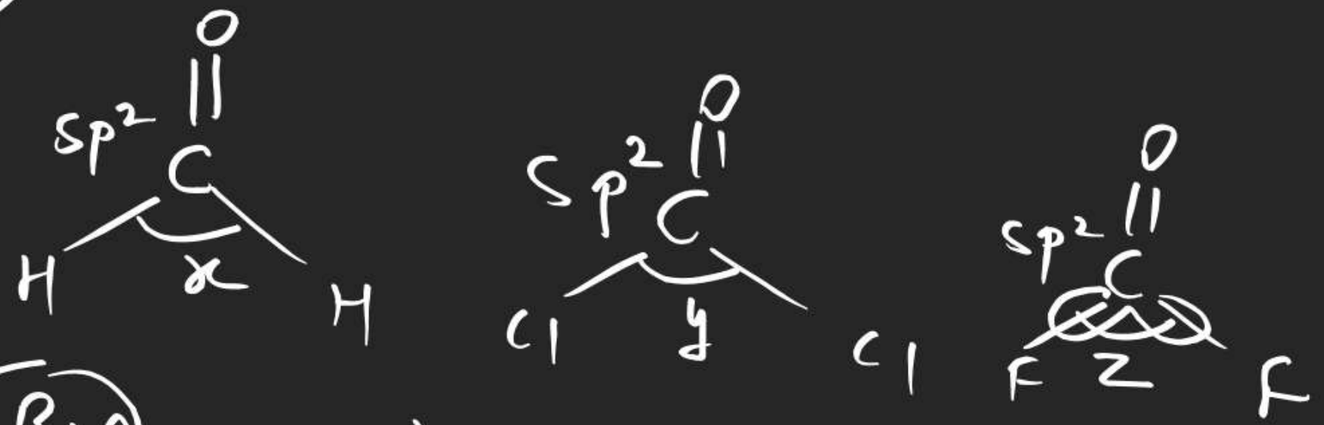
Condition of steric rep.

(1) Hyb. of molecule should be sp^3

(2) S.A should be 3rd period / 4 / 5 / 6 (Surrounding atom)

(3) C.A should be of 2nd period (central atom)

Ans



B.A = x > y > z

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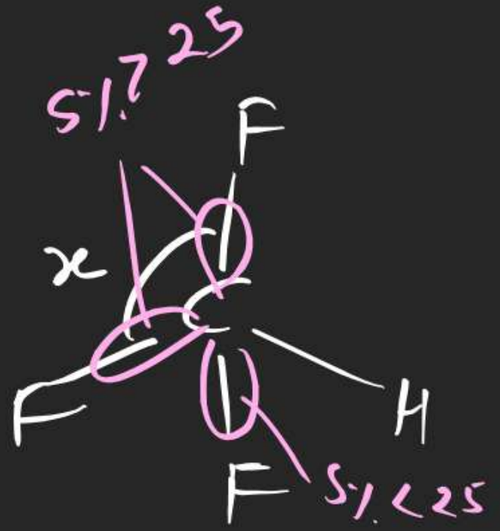
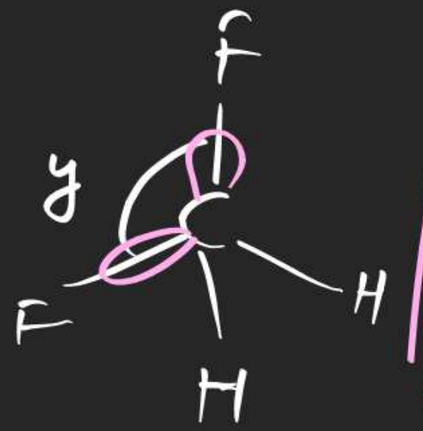
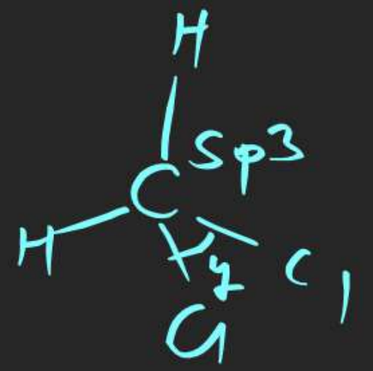


B.A

$x > y$





$x < y$

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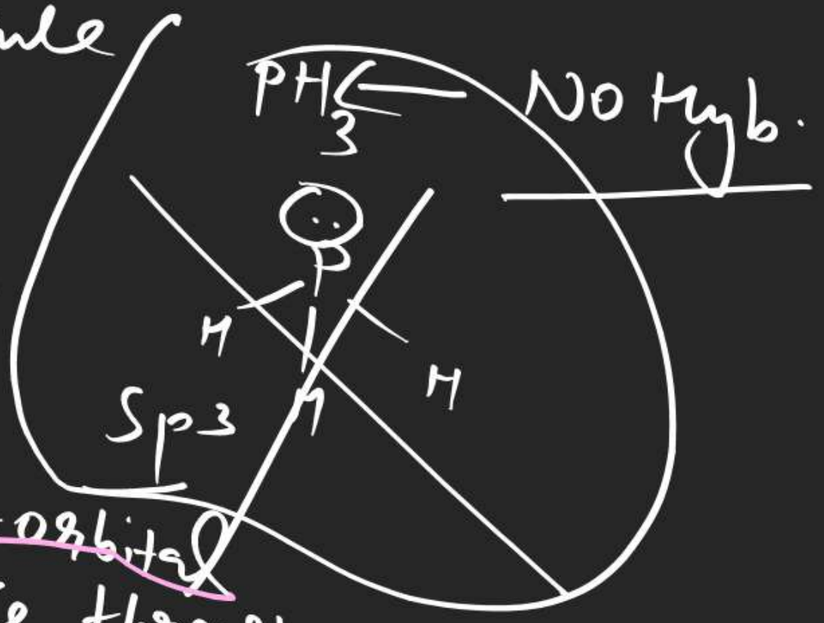
Dragol's Rule

When Central atom of molecule belongs to 3rd period or below this in periodic table then l.p present in Stereroco Chemically inactive S-orbital and bonding will take place through pure-p orbital, in this condition there is no Hyb. and B.A near about 90° but E.N of S.A is ≤ 2.5



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PH_3

$P = 3s^2\ 3p^3$

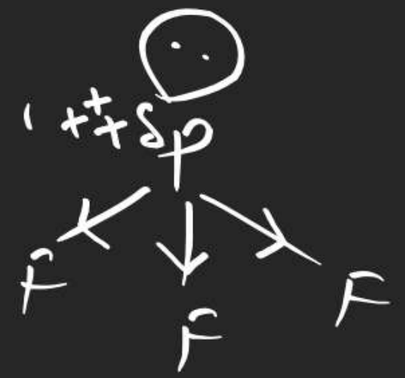
$3p$ ↑ ↑ ↑

↑↓

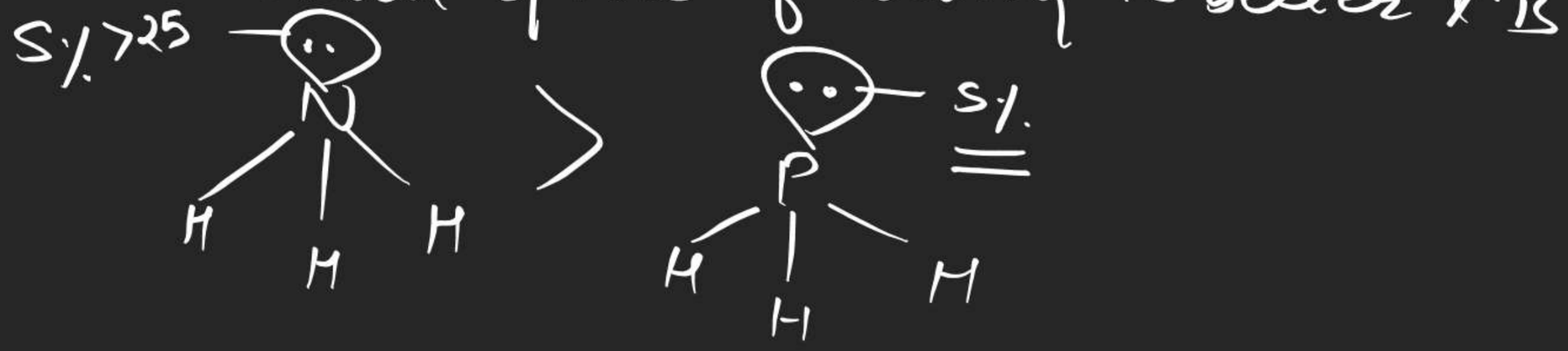
$3s$

600 KJ/mole

$3P-H < 600\ KJ/mole$



Which of the following is better L.B



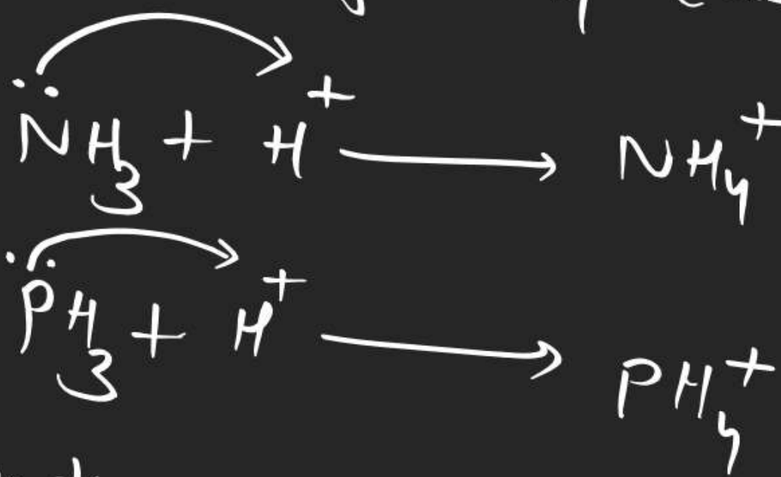
L.B ⇒ lone pair donating species

Ligand ⇒ L.P donating species

Which is better ligand

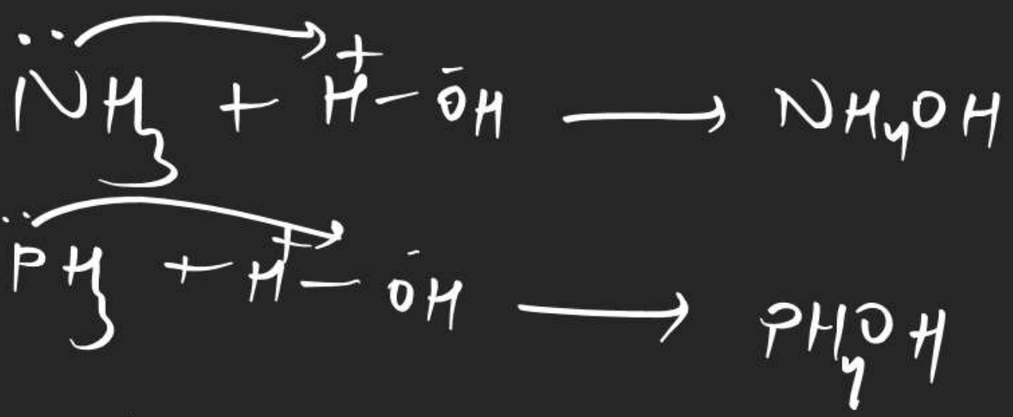
$\ddot{N}H_3 > \ddot{P}H_3$

Que formation of NH_4^+ easy or PH_4^+ easy



Ans NH_4^+ easy

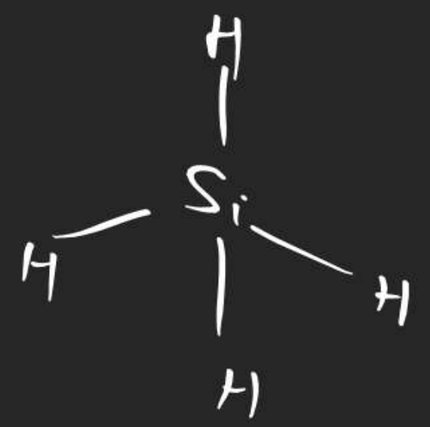
Which is better soluble in H_2O



Ans = NH_4OH

Ques What is the hyb. of SiH_4

Ans = sp^3



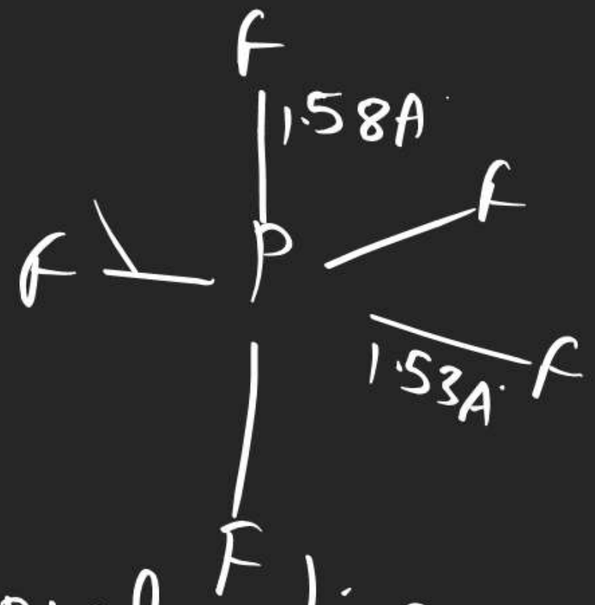
4 Si–H > 600 KJ/mole

NH_3 107	PH_3 AsH_3 SbH_3 BiH_3
104.5 H_2O	H_2S H_2Se H_2Te
sp^3	No hyb.
	B.A $\cong$ 90°
	due to drago's Rule

Berry's Pseudo Rotation

PF_5

1.58
1.53
.05



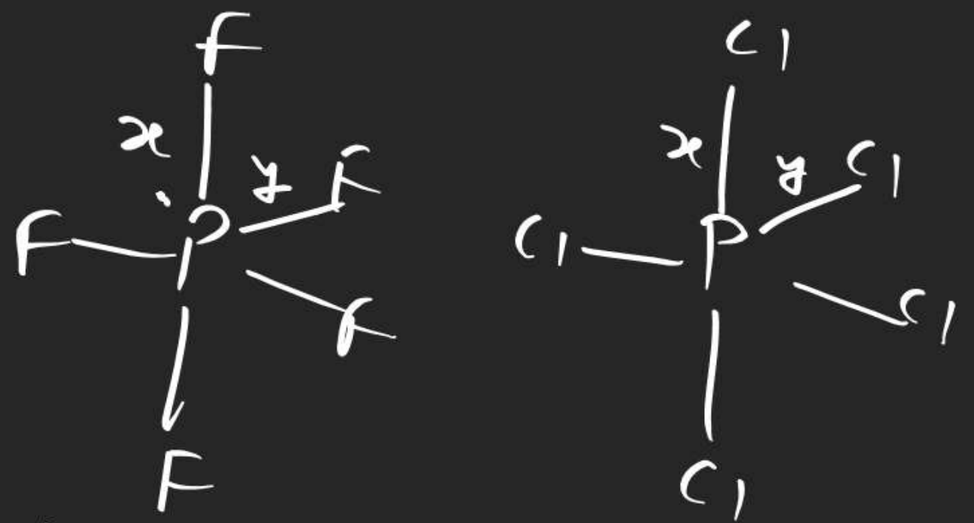
P-F axial B.L > P-F eq B.L

Trigonal bi pyramidal

B.L Calculation

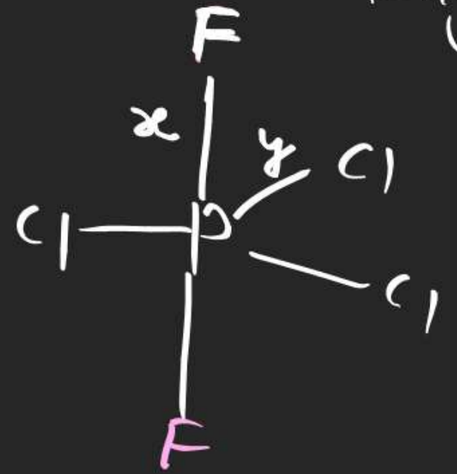
{
① N.M.R Spectroscopy
② X-Ray diffraction method
③ e^- diff method

B.L = Size of atom + Hybrid orbital length



$x > y$

$x > y$



$x < y$