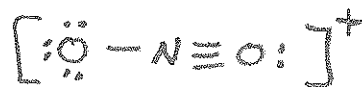
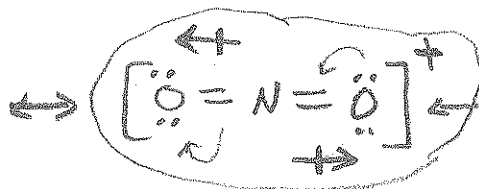




16 valence e^-

(1)



FC +1 +1 -1

ϕ +1 ϕ

-1 +1 +1

OS -2 +5 -2

-2 +5 -2

-2 +5 -2

EGG

LINEAR

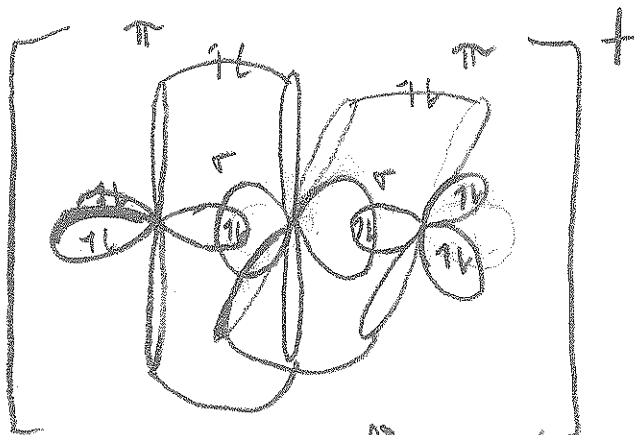
MGG

LINEAR

NON-POLAR ION
(EXCEPTING +1 charge)

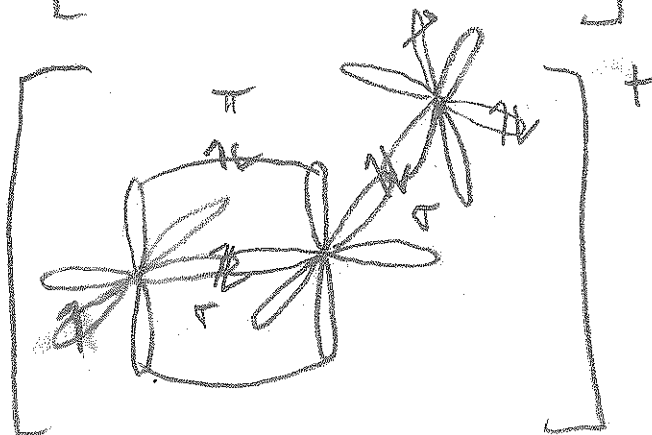
sp^2 sp sp^2

VBT with hybrid orbitals



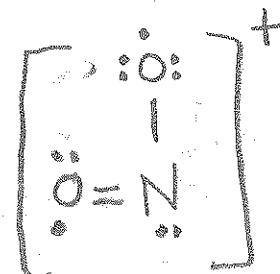
VBT with atomic orbitals

2s orbitals not shown for clarity



A di-radical w/a $\text{ONO} \angle = 90^\circ$

What this looks like using a Lewis Model

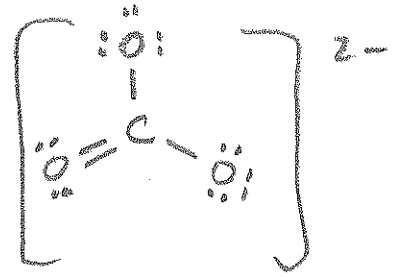
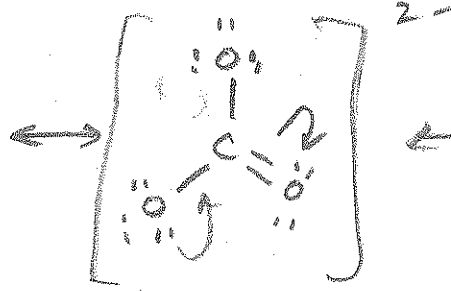
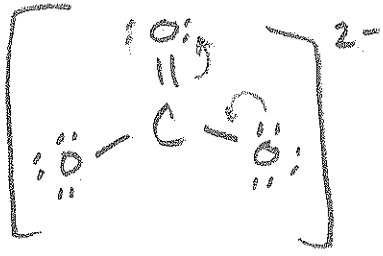


3 of the 4 lone pairs come from the 2s orbitals



24 valence e⁻

(2)



FC	-1	0	-1
OS	-2	+4	-2

-1	0	0
----	---	---

0	0	-1
---	---	----

SAME

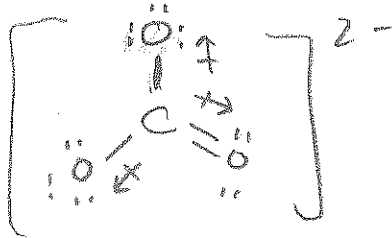
SAME

EGG

TRIGONAL
PLANAR

MGG

TRIGONAL
PLANAR



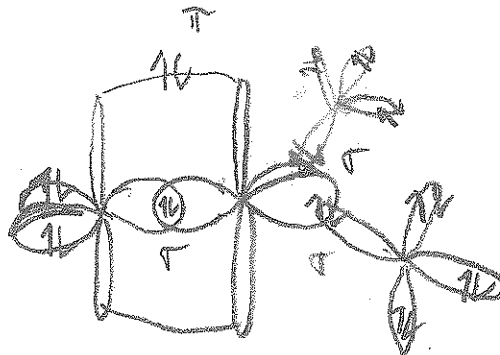
NON-POLAR ION
EXCEPTING CHARGE

sp³

sp³

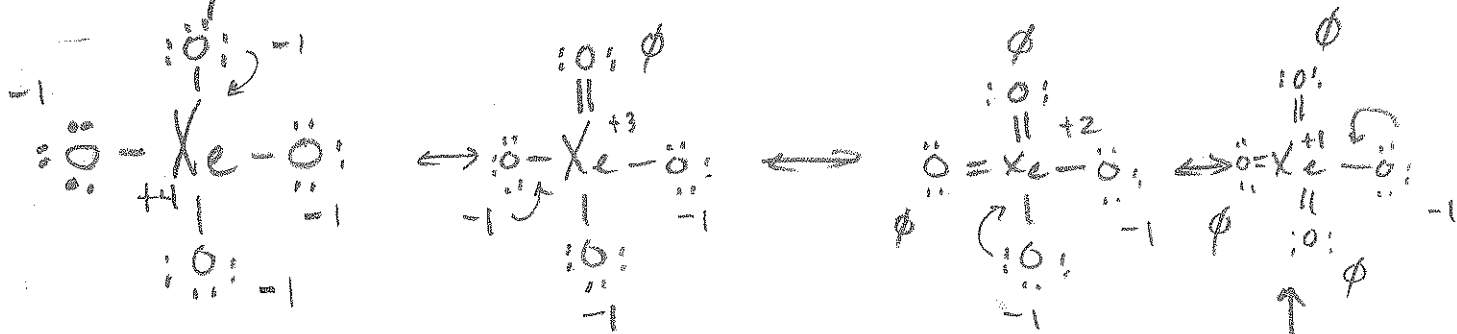
sp²

sp²



XeO_4 32 valence e^-

(3)



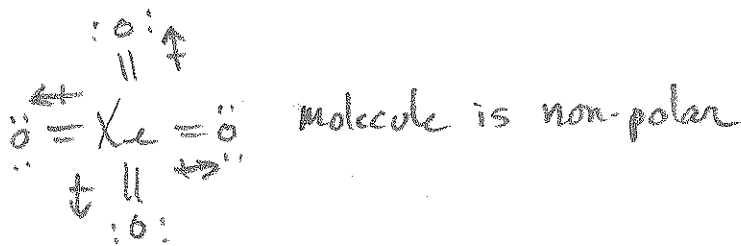
Some of the many resonance structures

FC see each structure

OS same for all, Xe is +8, O is -2

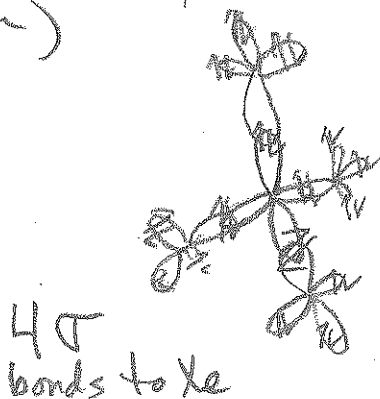
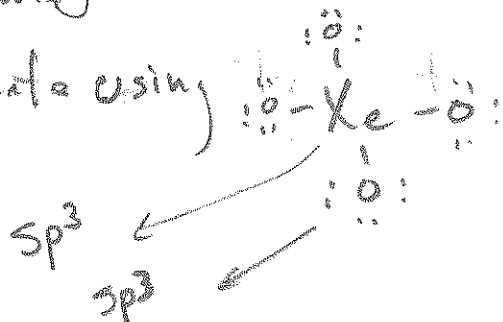
EGB: T_d

MGB: T_d



While this is the best Lewis resonance structure VBT does not allow for making 4 σ bonds and 4 π bonds to Xe (M.O. Theory is what is applied here given the Lewis + VBT breakdown)

Our best estimate using



ClOF 20 valence e⁻

4

3 central atom possibilities



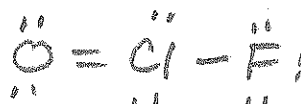
Use FC to eliminate some



Other resonance structures



Other resonance structures



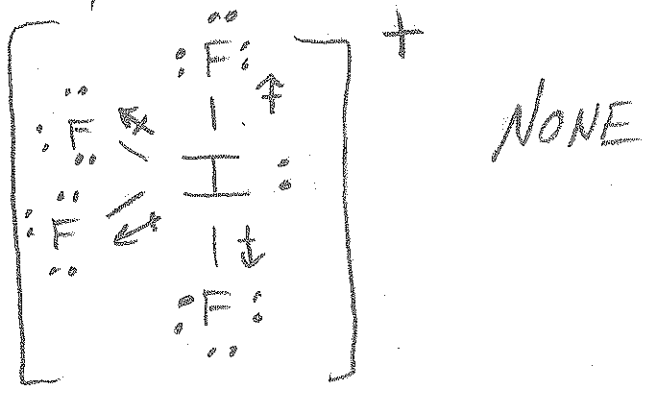
Fluorine is highly EN and would not tend to share more than once, particularly as a bonded central atom

Now, we see that both ClOF and OClF have the same # of resonance structures and they each have an all FC = ϕ form, and a form that has a central atom w/ FC = +1. OClF is the best central atom possibility w/ Cl having an expanded octet and a positive formal charge (Cl is less EN than O)

Let's work with OClF.

6

IF_4^+ 34 valence e^-



$FC_F = \phi$ $OS_F = -1$

$FC_I = +1$ $OS_I = +5$

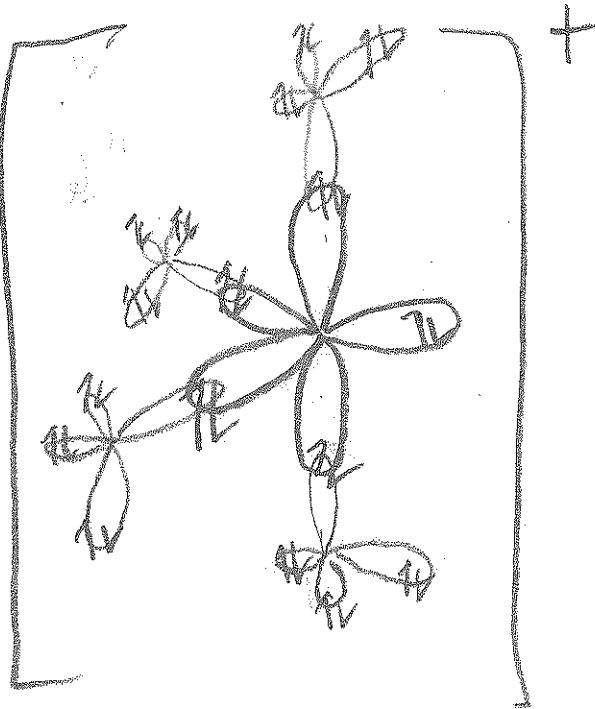
E66 Trigonal Bipyramidal

M66 Sessaw or disphenoidal

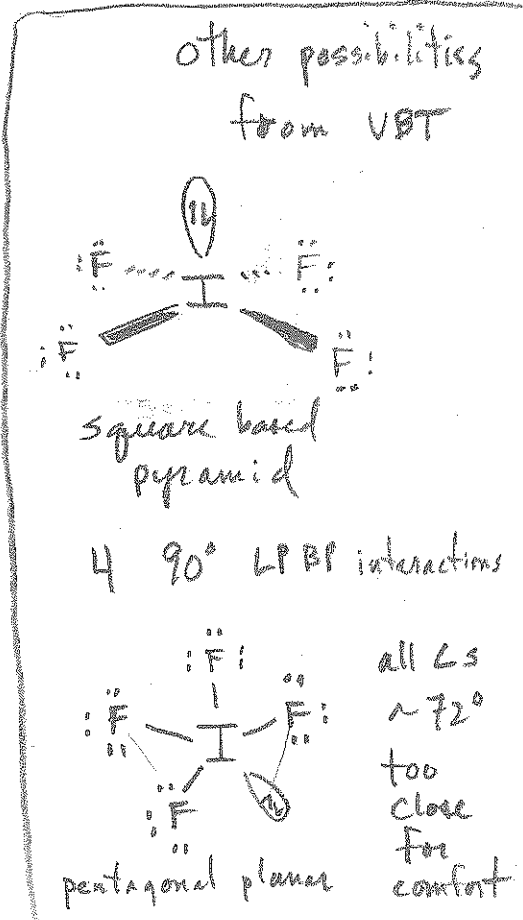
Polar ion, excepting charge

I is sp^3d

F is sp^3



2 90° LP BP interactions
 2 120° LP BP interactions



(Remember $LP-LP > LP-BP > BP-BP$)
 $90^\circ \quad 90^\circ \quad 90^\circ$