

AP CHEMISTRY

TOPIC 5: BONDING, PART D

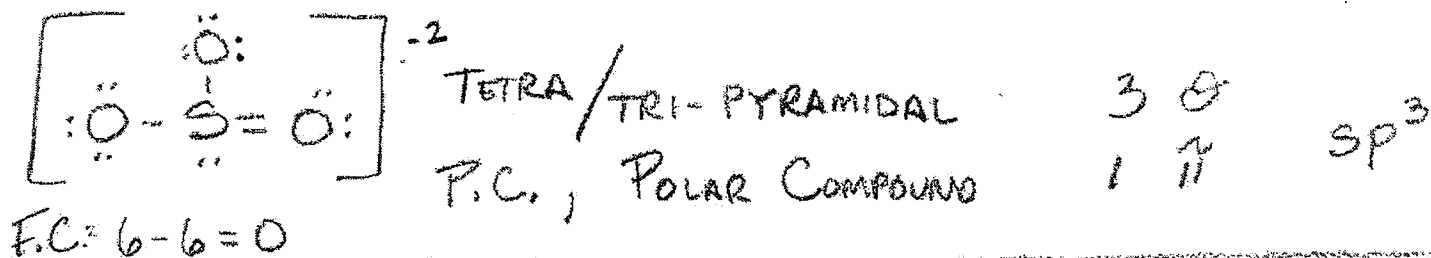
Day 54:

- Hybridization

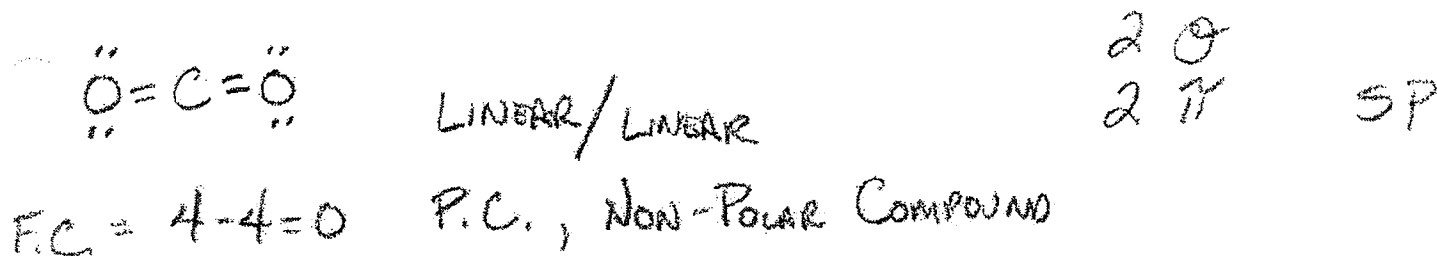
First draw the Lewis Structure, then name the shape with lone pairs and then indicate the name of the molecular shape (ignoring lone pairs, the shape the atoms form) and of course be aware of the Formal Charges.

Then, determine if the bond(s) in the molecule is/are non-polar covalent, polar covalent, or ionic. Then, determine if the molecule is a Polar or Non-Polar molecule. Then, indicate the correct hybridization for each and lastly, show how many sigma and pi bonds you have.

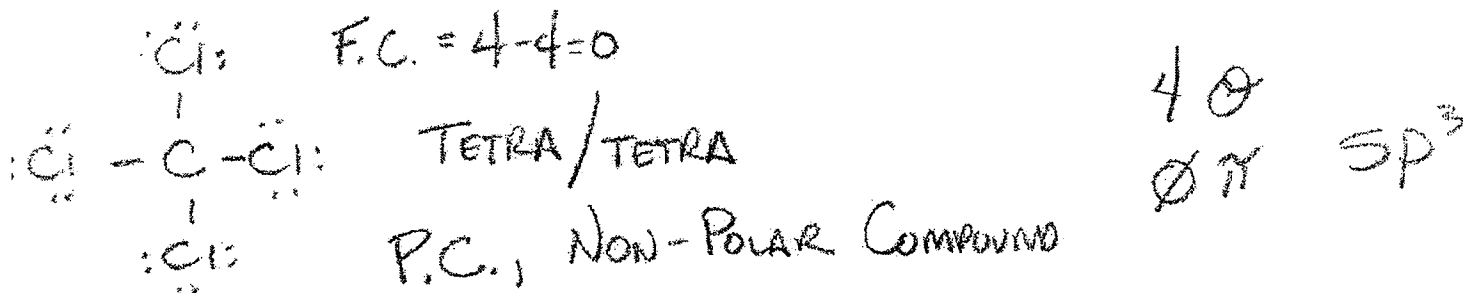
- 1) sulfite (polyatomic ion) SO_3^{-2} $6e^- + (2)(6e^-) + 2e^- = 26e^-$



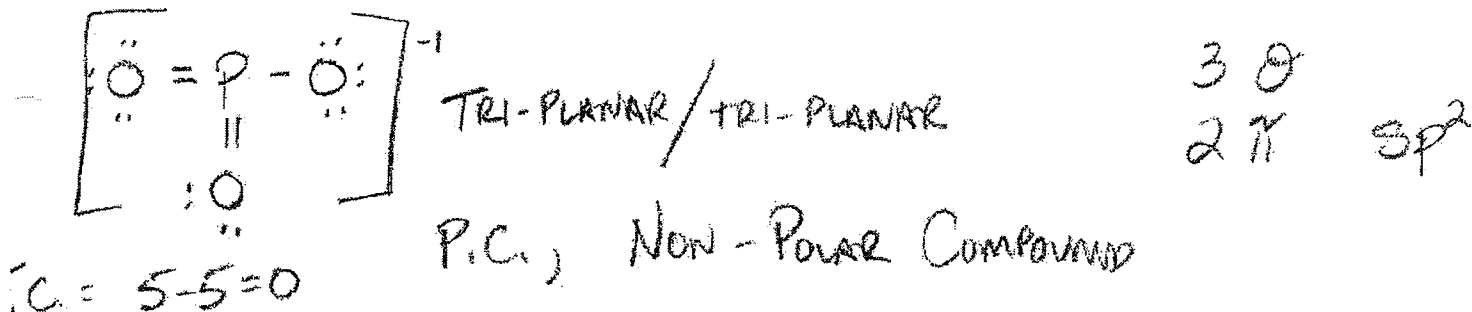
- 2) CO_2 $4e^- + 6e^-(2) = 16e^-$



- 3) carbon tetrachloride CCl_4 $4e^- + 7e^-(4) = 32e^-$



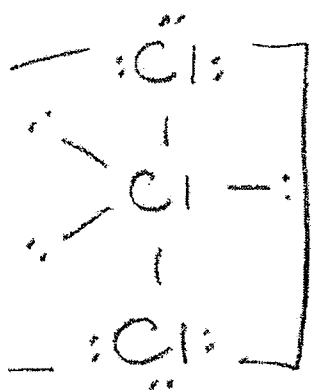
- 4) PO_3^{-1} $5e^- + 6e^-(3) + 1e^- = 24e^-$



5) Cl_3^- (this does not obey the formal charge)

$$7e^- (3) + 1e^- = 22e^-$$

$$\text{F.C.} = 7 - 8 = -1 \text{ (BEST WE CAN DO)}$$



TRI-BIPYRAMIDAL / LINEAR

N.P.C.

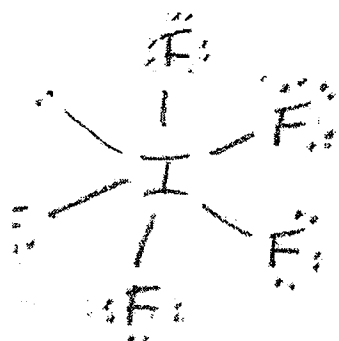
NON-POLAR COMPOUND

2 σ
0 π

dsp^3

6) iodine penta-fluoride

$$\text{IF}_5 \quad 7e^- + (5)7e^- = 42e^-$$



$$\text{F.C.} = 7 - 7 = 0$$

OCT / SQUARE PYR.

P.C.

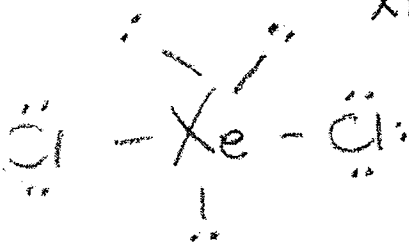
POLAR COMPOUND

5 σ
0 π

d^2sp^3

7) xenon dichloride

$$\text{XeCl}_2 \quad 8e^- + 7e^- (2) = 22e^-$$



TRI-BIPYR / LINEAR

P.C.

NON-POLAR COMPOUND

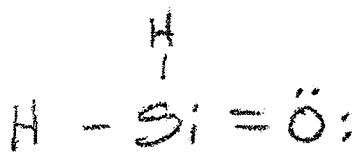
2 σ
0 π

dsp^3

$$\text{F.C.} = 8 - 8 = 0$$

8) H_2SiO

$$(2)1e^- + 4e^- + 6e^- = 12e^-$$



TRI-PLANAR / TRI-PLANAR

P.C.

POLAR COMPOUND

3 σ
1 π

sp^2

$$\text{F.C.} = 4 - 4 = 0$$