Introduction
Chapter 1

Chem 30A- Week 1

Concepts

Heteroatoms	Lewis Structures	Dipole Moments
Formal Charges	Resonance structures	electronegativity
VSEPR	3D molecular shapes	line formula

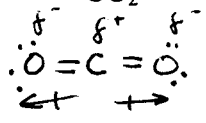
Class Problems

For each compound-

1. Draw the structure as the line formula.
2. Identify the molecular shape
3. Identify type of bond for each bond
4. Assign partial charges for each atom when applicable

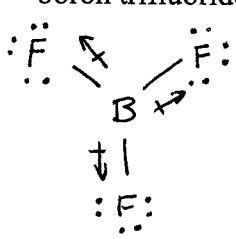
a. CO_2

EN
C = 2.5
O = 3.5



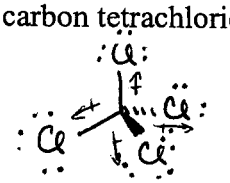
linear
ΔEN = 1
∴ polar cov.
μ = 0D

b. boron trifluoride



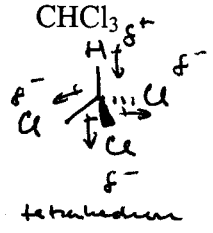
EN
B = 2.0
F = 4.0
ΔEN = 2
∴ polar
μ = 0D

c. carbon tetrachloride



tetrahedron
EN
C = 2.5
Cl = 3.0
ΔEN = 0.5 = polar cov.
μ = 0 D

d. $CHCl_3$

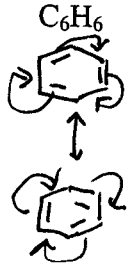


tetrahedron
EN
C = 2.5
Cl = 3.0
H = 2.1
δ_{pc}
0.4
npcov

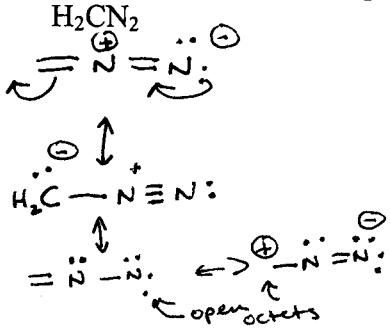
For each compound-

1. Draw the line formula structure
2. Draw the resonance forms
3. assign formal charges were applicable
4. Are the molecules polar?

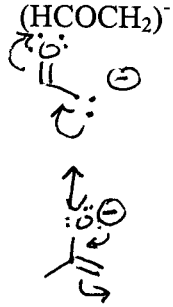
e. C_6H_6



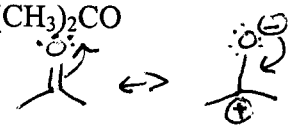
f. H_2CN_2



g. $(HCOCH_2)^-$

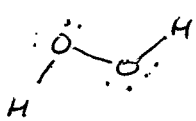


h. $(CH_3)_2CO$



Bonus

Is this molecule polar? Why? **H_2O_2**



YES

EACH Oxygen has a tetrahedral geometry the e⁻ pairs can not rotate past each other - so there is restricted movement around the O–O single bond H_2O_2 has a dipole moment of 2.