AP Chem: Homework 9-2: Electronegativity and Lewis Dot Structures
p.379 #33, 36, 40, 48 and Extra Lewis Dot Questions

9.33 **Both electronegativity and electron affinity give measures of how much an atom *attracts* electrons. However, they are defined differently. Define each of them.**

Electronegativity: the ability of an atom to attract electrons to itself when bonded to another atom.

Electron Affinity: the (negative of the) amount of energy released when an electron is added to an atom.

9.36 **Using electronegativity differences, arrange the following bonds in order of increasing ionic character: C to H; F to H; Br to H; Na to Cl; K to F; Li to Cl**

Least Ionic C–H (ΔEN = 0.4) < Br–H (ΔEN = 0.7) < F–H (ΔEN = 1.9) < Li–Cl (ΔEN = 2.0) < Na–Cl (ΔEN = 2.1) < K–F (ΔEN = 3.2) Most

9.40 **Using electronegativity differences, classify the following bonds as ionic, polar covalent, or nonpolar covalent. (Justify determinations by stating electronegativity differences for each.)**

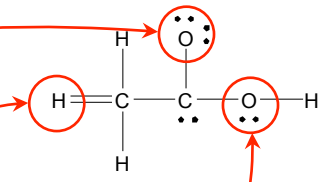
(a) Si-Si: The two silicon atoms are the same. The bond is non-polar covalent.

(b) Si-Cl: The electronegativity difference between Cl and Si is 3.0 – 1.8 = 1.2. The bond is polar covalent.

(c) CaF: The electronegativity difference between F and Ca is 4.0 – 1.0 = 3.0. The bond is ionic.

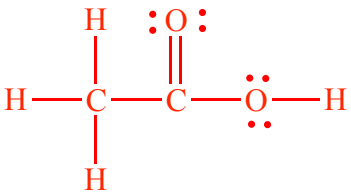
(d) N-H: The electronegativity difference between N and H is 3.0 – 2.1 = 0.9. The bond is polar covalent.

9.48 **The skeletal arrangement of the atoms of acetic acid shown here is correct, but the arrangement of electrons (in bonds and lone pairs) are not fully correct.**

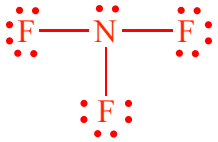
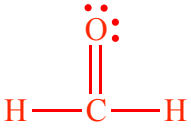
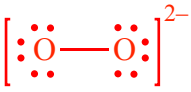
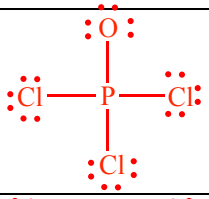
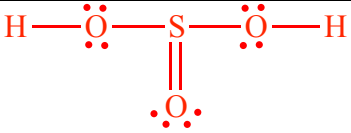
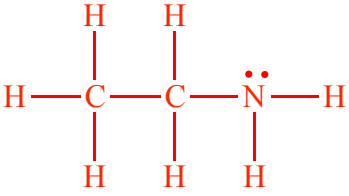


a) Identify what is wrong with the Lewis Dot Structure.
Neither oxygen atom has a complete octet. The left-most hydrogen atom is forming two bonds (4 e^-). Hydrogen can only be surrounded by at most two electrons.

(b) Write the correct Lewis Dot structure for acetic acid.



Lewis Dot Practice: Draw the Lewis Dot Structure for the following molecules. Sometimes the skeletal arrangement of the atoms is given. The underlined atom is at center of structure.

Formula	Total # of Val e	Lewis Dot
a) $\underline{N}F_3$	N: 5 3 F: 21 26	
b) O_2	2 O: 12	
c) N_2	2 N: 10	
d) $\underline{C}H_2O$	C: 4 2 H: 2 O: 6 12	
e) $\underline{N}_2F_2$	2 N: 10 2 F: 14 24	
f) NO^+	N: 5 O: 6 =10 +: –1	
g) O_2^{2-}	2 O: 12 2 –: 2 = 14	
h) $\underline{P}OCl_3$	P: 5 O: 6 3 Cl: 21 32	
i) H_2SO_3	2 H: 2 S: 6 = 26 3 O: 18	
j) $CH_3CH_2NH_2$	2 C: 8 N: 5 7 H: 7 20	
k) CH_3COOH	2 C: 8 4 H: 4 2 O: 12 24