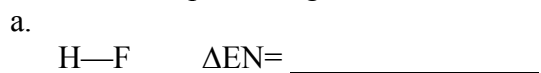


Be able to:

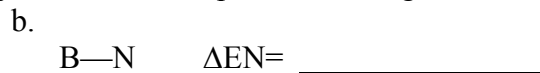
1. Describe a covalent bond and how it differs from an ionic bond.
2. Describe the octet rule and how it applies to formation of covalent bonds.
3. Describe sigma (σ) and pi (π) bonds.
4. Indicate how many pi bonds are there in a double covalent bond or in a triple covalent bond.
5. Indicate how does the bond strength relates to the bond length. Rank single, double, and triple bonds in terms of bond strength and bond length.
6. Describe bond dissociation energy and how it relates to bond strength.
7. Determine the names of covalent compounds and acids from their formulas and their formulas from their names (remember water— H_2O , ammonia— NH_3 , and methane— CH_4)
8. Apply the process of counting valence electrons and placing electron pairs on the structure for drawing Lewis structures of covalent compounds from their formulas
9. Indicate the bond angles for tetrahedral, trigonal planar, and linear molecules.
10. Draw a 3-D model and indicate the overall geometry, molecular shape, and bond angle for covalent molecules and polyatomic ions from their formulas
11. Use electronegativity to determine the polar character of a bond.
12. Use the bond polarity and symmetry of a molecule to determine if it is polar.
13. Computer chips article & worksheet
14. Problems ~~pg 236-237 #80, 81~~; pg. 272-273 #72, 73, 75, 78, 79, 80, 81, 84, 85, 86, 88, 89, 90, 91 (draw the Lewis Structures), 92, 94, 95, 96, 97, 98, 105 (no hybrid orbitals), 108, 109, 110, 111
15. Convert the following formulas to names and names to formulas:

- | | | | |
|---------------------------|-------|--------------------------|-------|
| a. N_2O | _____ | b. carbon dioxide | _____ |
| c. PF_3 | _____ | d. dinitrogen pentoxide | _____ |
| e. CCl_4 | _____ | f. diboron hexahydride | _____ |
| g. P_2O_5 | _____ | h. silicon tetrachloride | _____ |
| i. SF_6 | _____ | j. chlorine trifluoride | _____ |
| k. ClF_5 | _____ | l. xenon tetrafluoride | _____ |
| m. H_2Te | _____ | n. carbonic acid | _____ |
| o. HBrO | _____ | p. hydroiodic acid | _____ |
| q. HIO_3 | _____ | r. chlorous acid | _____ |

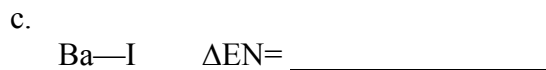
16. For the following bonds, determine ΔEN and polarity for each bond. If the bond is polar covalent, indicate the dipole using either the arrow or the δ symbols. If ionic, put in the charges.



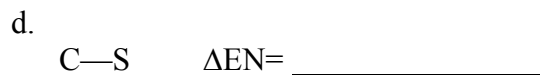
Polarity: _____



Polarity: _____

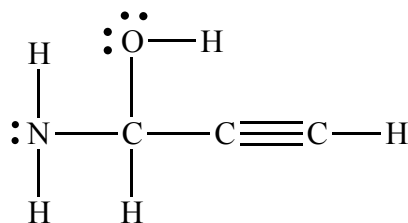
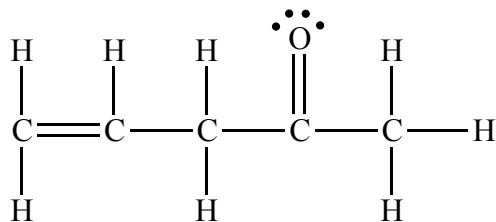


Polarity: _____

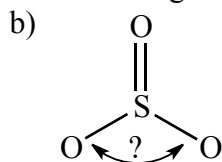
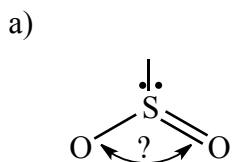


Polarity: _____

17. Draw a 3D model of these molecules. All bond angles should be correct.



18. Which molecule has a smaller bond angle? What are the bond angles? Explain.



19. In the article, *Computer Chips*, we learned that computer chips are made of ultrapure silicon (Si).

a. What kind of structure is Si? How are the Si atoms bonded to each other? What is their shape?

b. Why is it important to purify Si to 1 impurity atom in 1 billion ($1:1 \times 10^9$)? [Hint: what is the ratio of *doping* atoms to Si atoms?]

c. What is the purpose of doping Si? What are the two kinds of dopants, and what kind of charge carrier do they supply?

20. Draw the Lewis structures for the following molecules or polyatomic ions. Determine the electron and molecular geometries and draw the 3-dimensional structure. On the 3-D drawing, put a dipole arrow (\rightarrow) or the partial charges (δ^+/δ^-) on any polar bonds. Indicate whether the overall molecule is polar, and explain how you determined the molecular polarity (Are there any polar bonds? Is the molecule asymmetrical?).

Formula & #val. e^-	Lewis Structure (Show ALL electrons)	Electron & Molecular Geometries	3-D Drawing (show ALL dipoles)	Polar (Y/N)? Explain
a. SeO_3				
b. SO_2				
c. SiF_4				
d. PBr_3				
e. H_2Te				
f. CHCl_3				