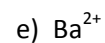


## Chapters 7 and 8: Chemical Bonding: Lewis Theory, Molecular shapes and hybridization

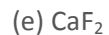
### Extra Credit Worksheet

Name: \_\_\_\_\_

#### 1. Write the Lewis symbols of the following



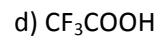
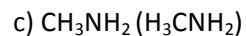
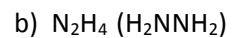
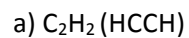
#### 2. Predict which of the following compounds are ionic and which are covalent, based on the location of their constituent atoms in the periodic table:



#### 3. Identify the more polar bond in each of the following pairs of bonds:

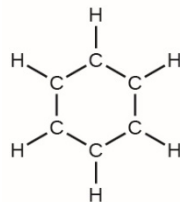
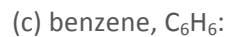


4. What will be the geometry about each central atom in the following molecules? Draw a sketch of the molecule. The skeletal structure for each molecule is listed in parentheses.



(both O atoms are attached to the second C, H atom is attached to O)

5. Write resonance forms that describe the distribution of electrons in each of these molecules or ions.



## 6. Fill in the Table:

Molecule	Lewis Structure	# of Electron groups on central atom	Electron geometry	Molecular geometry	Expected Bond angle (s)	Hybridization	Polar? Yes or No
$\text{COCl}_2$							
$\text{NH}_3$							
$\text{CH}_2\text{F}_2$							
$\text{HCN}$							
$\text{BrF}_4^-$							
$\text{OF}_2$							

7. Based on formal charge considerations, which of the following would likely be the correct arrangement of atoms in nitrosyl chloride: ClNO or ClON?

8. Based on formal charge considerations, which of the following would likely be the correct arrangement of atoms in hypochlorous acid: HOCl or OClH?

9. Which bond in each of the following pairs of bonds is the strongest?

(a) C—C            or            C=C

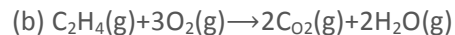
(b) C—N            or            C≡N

(c) C—H            or            O—H

10. Using the tabulated bond energies, determine the approximate enthalpy change for each of the following reactions:

(a)  $\text{H}_2(\text{g}) + \text{Br}_2(\text{g}) \rightarrow 2\text{HBr}(\text{g})$

11. Using the tabulated bond energies, determine the approximate enthalpy change for each of the following reactions:



12. Which compound in each of the following pairs has the larger lattice energy? Note:  $\text{Ba}^{2+}$  and  $\text{K}^+$  have similar radii;  $\text{S}^{2-}$  and  $\text{Cl}^-$  have similar radii. Explain your choices.



13. Draw all possible resonance Lewis structures for  $\text{NO}_2^+$ . Use Formal Charges to identify the best Lewis structure amongst them.

14. Methionine,  $\text{CH}_3\text{SCH}_2\text{CH}_2\text{CH}(\text{NH}_2)\text{CO}_2\text{H}$ , is an amino acid found in proteins. Draw a Lewis structure of this compound. What is the hybridization type of each carbon, oxygen, the nitrogen, and the sulfur?

