

# Non Sibi High School

Andover's Chem 550/580: Advanced Chemistry

## Chapter 11, Review Quiz 1

### 1

Draw the Lewis structure, name the molecular geometry (shape), draw a three-dimensional sketch, and indicate the bond angle for each of the following molecules and ions. Also state whether the neutral molecules are polar or nonpolar.

- $\text{BI}_3$
- $\text{CH}_2\text{Br}_2$
- $\text{FNO}$
- $\text{H}_3\text{O}^+$
- $\text{OCS}$
- $\text{PCl}_4^+$
- $\text{SF}_2$

### 2

Draw the Lewis structure, name the molecular geometry (shape), draw a three-dimensional sketch, and indicate the ideal bond angle(s) for each of the following molecules and ions. Also state whether the neutral molecules are polar or nonpolar.

- $\text{ClF}_3$
- $\text{IF}_5$
- $\text{KrF}_2$
- $\text{PCl}_4^-$
- $\text{SF}_5^+$
- $\text{SeF}_6$
- $\text{XeCl}_4$

### 3

Draw the Lewis structure and indicate the center atom hybridization for each of the following molecules and ions:

- a.  $\text{CHF}_3$
- b.  $\text{NO}_2^+$
- c.  $\text{NO}_3^-$

#### 4

Draw the Lewis structure for  $\text{NH}_2\text{CN}$  that has no formal charges and determine the number of sigma and pi bonds in the molecule.

#### 5

- a. Write the molecular orbital diagram for  $\text{F}_2$  and determine the bond order. Also state whether  $\text{F}_2$  is diamagnetic or paramagnetic.
- b. Is the bond length of  $\text{F}_2^-$  shorter or longer than the bond length of  $\text{F}_2$ ? Explain.



This work is licensed under a  
Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License  
Contact: [kcardozo@andover.edu](mailto:kcardozo@andover.edu)