CHEM 103
R&R 13
18 June 2024
Adapted from a 23 June 2021 document

1. Write Lewis structures that obey the octet rule:

a. Cl_2

b. CH_2Cl_2

c. HCO_3^-

d. NH_3

2. Draw resonance structures and select the most stable one for SCN^-.

3. The central atom has been underlined. Do not break the octet rule. Indicate formal charges when nonzero for each Lewis structure. Draw the predicted molecular geometry on the basis of VSEPR theory.

Molecular formula	Lewis structure (including formal charges)	Electron geometry name	Molecular structure	Approximate bond angles
$\underline{P}F_3$				
$As\underline{C}O^-$				
$\underline{Xe}O_4$				
$\underline{S}O_3$				

4. Consider the elements N, Mg, O, F, Al

a. Write the noble gas notation ground state electron configurations for each element.

b. Arrange the elements in order of increasing atomic radius.

c. Arrange the elements in order of increasing ionization energy.

5. Write the noble gas notation ground state electron configuration and determine whether it is diamagnetic or paramagnetic.

a. Al

b. S^{2-}

c. Fe^{3+}

6. Draw the Lewis dot structures for the following molecules:

a. CH_3Cl

b. HCN

c. CH_3COOH

d. Oxygen

e. C_2H_4O

7. Fill out the table in reference to the central atom, then draw the molecular geometry.

Molecule	Lewis structure	Electron pair geometry name	Molecular geometry name	Bond angles	Polar or nonpolar?
Ammonium ion					
Hydronium ion					
CH_2O					
SO_2					
PCl_5					
C_2H_2					
Challenge: $S_2O_3^{2-}$ "thiosulfate"					

Draw the molecular geometry here below! (Include resonance forms if applicable.)