

HW 4
CHEM 362

Due: October 15, 2019

1. Anions can be classified in four main ways, as well as categorized in four main ways.
 - a. Name the four classifications of anions and give an example of each.
 - b. Name the four main categories of anions and give an example of each

2. Given the following elements Li, Si, Na, Cl, K, Rb, Ca, C, N, Tl, P, S, Se:
 - a. Sort the above elements into which would form basic oxides or acidic oxides
 - b. Pick one from each category and write the balanced chemical equation for a reaction of that oxide with water.

3. List the ways in which OH^- can act as a ligand

4. Many oxoanions can act as ligands in more than one way (ie. multiple potential binding modes). Draw the ways for:
 - a. SO_4^{2-}
 - b. NO_2^-
 - c. ClO_3

5. Phosphates are important in chemistry as discrete anions and in condensed phases as minerals.
 - a. Draw the Lewis structure of PO_4^{3-}
 - b. Draw the way(s) phosphate can bind
 - c. Draw two examples of phosphate assembly structures.

6. Explain in detail the basic composition of zeolites. Give two examples of what zeolites are used for.

7. Draw the structures of $\text{Cr}_2\text{O}_7^{2-}$, $\text{Si}_2\text{O}_7^{6-}$, and $\text{B}_2\text{O}_5^{4-}$

8. How does CN^- bond to metals? Explain this using MO theory. (*Hint: draw an MO diagram!*)