

## Chemistry Module 9 Homework

### Assignment #1

Read pages 285 – 297.

1. What is a polyatomic ion?
2. List the chemical formula AND THE CHARGE of each ion:
  - a. nitrite
  - b. sulfate
  - c. carbonate
  - d. hydroxide
  - e. acetate
  - f. phosphate
  - g. chlorite
3. Give the names of the following ions:
  - a.  $\text{CN}^-$
  - b.  $\text{ClO}_3^-$
  - c.  $\text{C}_2\text{H}_3\text{O}_2^-$
  - d.  $\text{NO}_2^-$
  - e.  $\text{CrO}_4^{2-}$
  - f.  $\text{SO}_3^{2-}$
4. Give the chemical formulas for the following compounds:
  - a. magnesium nitrate
  - b. sodium sulfate
  - c. aluminum nitrite
  - d. calcium phosphate
  - e. ammonium oxide
5. Name the following compounds:
  - a.  $\text{Al}(\text{NO}_3)_3$
  - b.  $(\text{NH}_4)_3\text{N}$
  - c.  $\text{Be}(\text{C}_2\text{H}_3\text{O}_2)_2$
  - d.  $\text{Mg}(\text{OH})_2$
  - e.  $\text{Na}_2\text{CO}_3$
6. Name the following compounds using the “ic”, “ous” system.
  - a.  $\text{CoF}_3$
  - b.  $\text{Fe}_2\text{O}_3$
  - c.  $\text{Pb}(\text{C}_2\text{O}_4)_2$
7. Write the formulas for the following compounds.
  - a. Mercuric chloride
  - b. Chromous phosphate
  - c. Stannous sulfate
8. Find 5 products in your home that have **chemical compound** names on their labels. Cut out the label, tape it to a sheet of paper, and write the chemical formula of the molecule. It HAS TO be something that follows the naming rules we are studying, not just any chemical.
9. Honors - Write the balanced chemical equation for the reaction in which aqueous sodium carbonate reacts with aqueous calcium nitrate to make aqueous sodium nitrate and solid calcium carbonate.

## Chemistry Module 9 Homework

### Assignment #2

Read pages 298 – 308.

10. What does VSEPR stand for?
11. What causes some molecules have a three-dimensional shape?
12. List the five VSEPR shapes and the bond angle for each.
13. Determine the shape and bond angle of a  $\text{CH}_4$  molecule. Draw the Lewis diagram.
14. Determine the shape and bond angle of a  $\text{NBr}_3$  molecule. Draw the Lewis diagram.
15. Determine the shape and bond angle of a  $\text{CS}_2$  molecule. Draw the Lewis diagram.
16. Determine the shape and bond angle of a  $\text{CH}_2$  molecule. Draw the Lewis diagram.
17. Determine the shape and bond angle of a  $\text{CF}_3\text{Cl}$  molecule. Draw the Lewis diagram.
18. What causes some covalent bonds to be polar?
  
19. “Oil and water don’t mix” is a phrase used to explain why very different people don’t get along. Why do oil and water not mix?
  
20. Why does soap help to wash away stains that water cannot wash away by itself?
  
21. Determine if the molecule is ionic or covalent. Draw the Lewis diagram for each covalent molecule. Classify the covalent molecules as polar covalent or purely covalent:
  - a.  $\text{CCl}_4$
  - b.  $\text{NF}_3$
  - c.  $\text{H}_2$
  - d.  $\text{CaCl}_2$
  - e.  $\text{SiFCl}_3$
  - f.  $\text{SiO}_2$
  
22. Polar substances, like water, will dissolve polar and ionic molecules. Which of the substances in the previous problem would you expect to dissolve in water?
  
23. Honors - Why are the bond angles in a pyramidal shape smaller than the bond angles in a tetrahedral shape?