

## Chemistry 105

### Homework Set # 3 (20 points)

Due by Monday, November 1 (Drop off SC 218, fax to: 630-617-6441 or e-mail.)

These questions are based on material in chapter 4 (sections 4.3-4.5, 4.9 and 4.15) and chapter 5 (sections 5.1-5.2).

1. Which of the following pairs of elements are likely to form an ionic compound? *hint: Binary, or two-element, ionic compounds formed from positive metal ions and negatively charged non-metal ions.* Circle ALL that apply.

- |                          |                           |
|--------------------------|---------------------------|
| (a) potassium and oxygen | (d) chromium and oxygen   |
| (b) oxygen and carbon    | (e) nitrogen and chlorine |
| (c) bromine and sodium   | (f) tungsten and oxygen   |

2. Write the formula for each of the following ionic compounds:

*example: sodium nitride*

*. identify ions: sodium =  $Na^+$ , nitride =  $N^{3-}$*

*. determine formula (see example 4.5, page 98 of the text):  $Na_3N$*

- |                       |                       |
|-----------------------|-----------------------|
| (a) cesium chloride   | (d) aluminum oxide    |
| (b) magnesium bromide | (e) potassium sulfide |
| (c) strontium nitride | (f) rubidium bromide  |

3. Write the names of each of the following ionic compounds.

*examples - name of metal first, followed by non-metal with -ide ending*

- $NaCl$  = sodium chloride*
- $Mg_3N_2$  = magnesium nitride*

- |              |               |
|--------------|---------------|
| (a) $Na_2O$  | (d) $FeCl_3$  |
| (b) $LiBr$   | (e) $CaO$     |
| (c) $CaCl_2$ | (f) $Ca_3N_2$ |

4. Write the formula for the polyatomic ion in each of the following compounds. (see text section 4.9, consult table page 106)

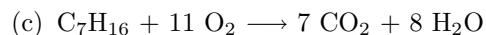
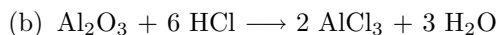
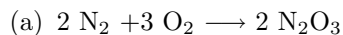
*example:  $Na_2SO_3$        $SO_3^{2-}$*

- |                  |              |
|------------------|--------------|
| (a) $Li_3PO_4$   | (d) $BaSO_4$ |
| (b) $NaNO_3$     | (e) $NaOH$   |
| (c) $Cu(NO_2)_2$ | (f) $CaCO_3$ |

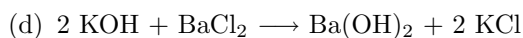
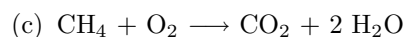
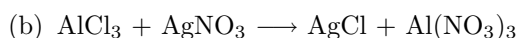
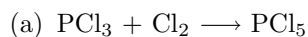


**Balancing Chemical Equations**

8. All of the following are balanced equations. State the number of atoms of each element in the reactants and in the products.



9. Are the following equations balanced? Indicate YES or NO. If NO explain why not:



10. Balance the following equations:

