Guided Notes for Section 8.1

- In the chemical reaction below, label the products and reactants:

    $(NH_4)_2Cr_2O_7$ (s) $\rightarrow N_2$(g) + Cr_2O_3(s) + $4H_2O$(g)
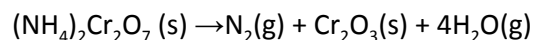
- What is a chemical reaction?

- Explain how a chemical equation describes chemical reactions:

- List and describe 3 indications of a chemical reaction:

- List and describe 3 characteristics of a chemical equation. These characteristics will be a good checklist for when you are asked to write chemical equations:

    1.
    2.
    3.   (Include the definition of a coefficient)

- List the 7 elements that normally exist as diatomic molecules—(remember any time you have these elements by themselves in a chemical equation, there will be 2 atoms! Also remember that P exists as P_4 and S exists as S_8):

- What is a word equation and why is it useful to write them as a first step in writing a chemical equation?

    o   Write a word equation for a chemical reaction that occurs when solid sodium oxide is added to water at room temperature and forms sodium hydroxide (dissolved in water).

    Sodium oxide

- What is a formula equation?

    o   Write the formula equation for the chemical reaction above (with sodium oxide and

water yielding sodium hydroxide).

- o Now BALANCE the formula equation you wrote above by using coefficients to balance out the number of atoms of each element on both sides of the equation (we will have a lot more practice with this so give this a first try here and use the book to help you).

- What is a reversible reaction and how do you use a symbol to represent it?

- o Give a word and formula equation that exemplifies a reversible reaction.

Example problems:

Write the word and balanced chemical equation for the following reactions. Include symbols for the physical states when indicated:

a. Solid calcium reacts with solid sulfur to produce solid calcium sulfide.

b. Hydrogen gas reacts with fluorine gas to produce hydrogen fluoride gas.

Translate the following chemical equations into sentences:

a. $CS_2(l) + 3O_2(g) \rightarrow CO_2(g) + 2SO_2(g)$
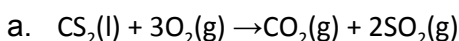
- A lot of very important information can be gathered from an accurate chemical equation, which allows us to create many substances and predict the behavior of chemical together. But quantity is very important.
  - o The coefficient of a chemical reaction indicate relative, not absolute, amounts of reactants and products.
    - ▪ Given this equation, explain how the formula can fill in the information about the ratio of each substance in the reaction.

$PbCl_2(aq) + Na_2CrO_4(aq) \rightarrow PbCrO_4(s) + 2NaCl(aq)$
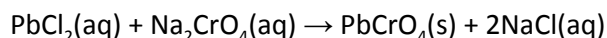
__ molecule(s) $PbCl_2$: __ molecule(s) Na_2CrO_4: __ molecule(s) $PbCrO_4$: __ molecule(s) NaCl

30 molecules $PbCl_2$:   __ molecules Na_2CrO_4: __ molecules $PbCrO_4$: __ molecules NaCl

__ mole (s) $PbCl_2$:   __ mole (s) Na_2CrO_4: __ mole(s) $PbCrO_4$: __ mole(s) NaCl

- o The relative masses of the reactants and products of a chemical reaction can be determined from the reaction's coefficients.
  - ▪ Give the equation above, find the relative masses of the reactants and products (in other words, when the reaction occurs, how much mass of each reactant is needed and how much mass of product comes out of it?)

  Grams of $PbCl_2$:

  Grams of Na_2CrO_4:

  Grams of $PbCrO_4$:

  Grams of NaCl:

- o The reverse reaction for a chemical equation has the same relative amounts of substances as the forward reaction.
  - ▪ If the reaction above were to be reversed (so if lead (II) chromate reacted with sodium chloride to produce lead (II) chloride and sodium chromate) would that change the amount of each substance involved?

Read through "Balancing Chemical Equations" but really I have a handout that will be useful for this…

Then try the 8.1 Textbook Problems worksheet.