Name _____

Date _____ **Pd** ____

Unit 8 – Stoichiometry Worksheet 1: Mole relationships

For each of the problems below, use the five steps discussed in class. Answer on a separate piece of paper.

1. Write the balanced chemical equation
2. Identify what is given (with units) and what you want to find (with units) in a BCA table
3. Use the mole ratio from the balanced equatin to calculate remaining values in the Table (dimensional analysis style). **Show your work beneath the BCA table**.
4. Complete the BCA Table using calculation results
5. Find the desired quantity in your work. Write and box in that answer with unit, substance.

1. Hydrogen sulfide gas, which smells like rotten eggs, burns in air to produce sulfur dioxide and water. How many moles of oxygen gas would be needed to completely burn 8.0 moles of hydrogen sulfide? (The BCA table is done as an example. Make/copy your own on your own piece of paper).

   Equation: ___ $H_2S_{(g)}$ + ___ $O_{2\,(g)}$ → ___ $SO_{2(g)}$ + ___ $H_2O_{(g)}$

   Before:

   FILL IN THE VALUES ON YOUR OWN PAPER

   Change (SHOW WORK UNDER THE TABLE)

   After

2. Propane, C_3H_8, burns in air to form carbon dioxide and water. If 12 moles of carbon dioxide are formed, how many moles of propane were burned?

3. Ammonia, NH_3, for fertilizer is produced by causing hydrogen and nitrogen to react at high temperature and pressure. How many moles of ammonia can be made from 0.15 moles of nitrogen gas?

4. The poison gas phosgene, $COCl_2$, reacts with water in the lungs to form hydrochloric acid and carbon dioxide. How many moles of hydrochloric acid would be formed by 0.835 moles of phosgene?

5. Nitric acid, HNO_3, is used in the production of trinitrotoluene, (TNT), an explosive. The equation (not balanced) is

   _____C_7H_8 + _____HNO_3 —> __$C_7H_5N_3O_6$ + _____H_2O

   toluene *TNT*

   a) How many moles of nitric acid are required to react with 4.5 moles of toluene? (make your own BCA table)
   b) How many moles of TNT should be produced?

6. Iron metal and oxygen combine to form magnetite, the magnetic oxide of iron, Fe_3O_4.
   a) How many moles of iron can be converted to magnetite by 8.80 moles of pure oxygen? (make your own BCA table)
   b) How many moles of the magnetic iron oxide would be produced?