**Name: Period: Seat#:**

**Worksheet #6**

* **Show work and include ALL units.**
* **Try to do these limiting reagent problem without the template. Please try doing it WITHOUT looking at the template either! See if you can do it all on your own!**
* **Do these on binder paper.**
* **Label clearly so I know what I am looking at. Box and label final answers!**

1. Consider the unbalanced reaction \_\_\_\_\_I2O5(g) + \_\_\_\_\_CO(g) 🡪 \_\_\_\_\_CO2(g) + \_\_\_\_\_I2(g)  
   80.0 grams of iodine(V) oxide, I2O5, reacts with 28.0 grams of carbon monoxide, CO.
2. Determine the mass of iodine I2, which could be produced? 50.7 g
3. If only 0.160 moles of iodine, I2 was produced, what mass of iodine was produced? 40.6 g
4. What percentage yield of iodine was produced? 80.1%
5. Zinc and sulphur react to form zinc sulphide according to the equation. Zn + S 🡪 ZnS

If 25.0 g of zinc and 30.0 g of sulphur are mixed,

1. Which chemical is the limiting reactant? Zn
2. How many grams of ZnS will be formed? 37.26 g
3. How many grams of the excess reactant will remain after the reaction is over? 17.7 g
4. Mg is ignited in pure oxygen.
   * 1. Which element is in excess when 3.00 grams of Mg is ignited in 2.20 grams of pure oxygen?
     2. What mass is in excess? 0.23 g
     3. What mass of MgO is formed? 4.97 g
5. How many grams of Al2S3 are formed when 5.00 grams of Al is heated with 10.0 grams S? 13.91 g
6. When MoO3 and Zn are heated together they react Zn(s) + MoO3(s) ----------> Mo2O3(s) + ZnO(s)

What mass of ZnO is formed when 20.0 grams of MoO3 is reacted with 10.0 grams of Zn? 12.45 g

1. Silver nitrate, AgNO3, reacts with ferric chloride, FeCl3, to give silver chloride, AgCl, and ferric nitrate, Fe(NO3)3.   
    In a particular experiment, it was planned to mix a solution containing 25.0 g of AgNO3 with another solution   
    containing 45.0 grams of FeCl3.
   * 1. Write the chemical equation for the reaction.
     2. Which reactant is the limiting reactant? AgNO3
     3. What is the maximum number of moles of AgCl that could be obtained from this mixture? 0.147 mol
     4. What is the maximum number of grams of AgCl that could be obtained? 21.9 g
     5. How many grams of the reactant in excess will remain after the reaction is over? 37.04 g
2. Solid calcium carbonate, CaCO3, is able to remove sulphur dioxide from waste gases by the reaction:   
   CaCO3 + SO2 + other reactants ------> CaSO3 + other products

In a particular experiment, 255 g of CaCO3 was exposed to 135 g of SO2 in the presence of an excess amount of the other chemicals required for the reaction.

1. What is the theoretical yield of CaSO3? 253.2 g
2. If only 198 g of CaSO3 was isolated from the products, what was the percentage yield of CaSO3 in this experiment? 78.21%
3. A research supervisor told a chemist to make 100 g of chlorobenzene from the reaction of benzene with chlorine and to expect a yield no higher that 65%. What is the minimum quantity of benzene that can give 100 g of chlorobenzene if the yield is 65%? The equation for the reaction is: 106.7 g

C6H6 + Cl2 -----------> C6H5Cl + HCl

benzene chlorobenzene