

## Chemistry Unit 8 - Worksheet 5

### Samples of Every Kind of Problem

*On a separate sheet of paper, write a complete solution to each of the problems below. Follow the procedures outlined in class, including BCA Tables. Be sure to box your final answer(s). Final answers should have chemical formulas and not chemical names.*

1. Calculate the number of moles of solid potassium chlorate that must decompose to produce solid potassium chloride and 1.8 moles of oxygen gas.
2. In a single displacement reaction, magnesium metal reacts with hydrochloric acid solution (HCl) to produce magnesium chloride solution and hydrogen gas. How many moles of hydrochloric acid are needed to completely react with 2.43 g of magnesium?
3. Ethane,  $C_2H_6$  reacts with oxygen gas to produce carbon dioxide gas and water vapor. What mass of oxygen gas is required to react with 2.20 moles of ethane?
4. In the copper–silver nitrate reaction, copper metal and silver nitrate solution react to produce silver metal and copper(II) nitrate in solution. A student placed a copper wire with a mass of 2.93 g in the reaction test tube. The silver nitrate solution contained 1.41 g of silver nitrate. She obtained 0.870 g of silver metal. Calculate the percent yield of silver.
5. Phosphorus and liquid bromine react vigorously together to form phosphorus tribromide. If 5.0 g of phosphorus and 35 g of bromine react, how many grams of  $PBr_3$  could be produced? Which reactant is the limiting reactant?
6. Zinc sulfide and oxygen gas react to form zinc oxide and sulfur dioxide gas. Determine the amount of zinc oxide that should be produced in a reaction between 46.5 g of zinc sulfide and 13.3 g of oxygen. What is the mass of the excess reactant?

**KEY TO WS5:**

1. 1.2 mol potassium chlorate                      2. 0.200 mol HCl                      3. 246 g oxygen gas
4. 97.2 %                      5. 40. g  $PBr_3$ ; LR \_\_\_\_\_                      6. 22.6 g zinc oxide; 19.5 g  
xs \_\_\_\_\_