Chemistry CP

Name: _____

Real Life Stoichiometry: Limiting Reagent Problems   Date: _____

When the quantities of two (or more) reactants are given in a problem, you must first determine which reactant is the "limiting reagent," or the one which will run out first, causing the reaction to stop. You can then calculate the amount of product produced <u>using the limiting reagent</u> to do the calculation.

To calculate the limiting reagent:
- Separately for each reactant, calculate the amount of product formed.
- The calculation that gives the LEAST amount of product is the correct answer and identifies the LR.
- If any other calculations are necessary, use the limiting reagent.

Example:
How many grams of ammonia can be formed when 20.0 g of nitrogen gas react with 10.0 g of hydrogen gas according to the equation:

$N_2(g)$ + $3 H_2(g)$ $\rightarrow$ $2 NH_3(g)$
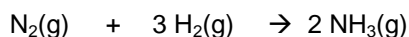
	$N_2(g)$	$3 H_2(g)$	$2 NH_3(g)$
Moles			
g = moles x gfm			

1. When copper metal comes in contact with silver nitrate solution, silver metal comes out of solution and copper (II) nitrate is formed (as in your lab!). If 100.0 grams of copper metal are reacted with 100.0 g of silver nitrate, how many grams of silver metal will be produced? (63.50 g)

_____Cu + _____AgNO$_3$ $\rightarrow$ _____Cu(NO$_3$)$_2$ + _____ Ag
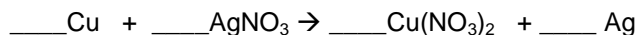
	____Cu	____AgNO$_3$	____Cu(NO$_3$)$_2$	____ Ag
Moles				
g = moles x gfm				

2. Aluminum burns in bromine producing aluminum bromide. In a certain experiment, 6.0 grams of aluminum were reacted with 40.0 grams of bromine. How much aluminum bromide can be formed? **Start with a balanced equation.** (44.5 g $AlBr_3$)

	____Al +	____Br_2 →	____$AlBr_3$
Moles			
g = moles x gfm			

3. Aluminum reacts with oxygen to produce aluminum oxide.
How many grams of aluminum oxide can be formed when 65.0 grams of aluminum react with 115.0 grams of oxygen? (123 g Al_2O_3)

	____Al +	____O_2 →	____Al_2O_3
Moles			
g = moles x gfm			

4. Hydrochloric acid reacts with zinc metal to produce hydrogen gas in a single displacement reaction. How many grams of hydrogen can be produced from the reaction of 12.0 grams of zinc with 3.65 grams of HCl? Start with a balanced equation! (.201 g H_2)

	____HCl +	____Zn →	____$ZnCl_2$ +	____H_2
Moles				
g = moles x gfm				