Dougherty Valley HS Chemistry
Stoichiometry – Limiting Reagent Stoich Practice

Worksheet #5

Name: **Period:** **Seat#:**

- **Show work and include ALL units.**
- **Use a SINGLE DIMENSIONAL ANALYSIS line method set ups for ALL conversions.**

Given the following reaction: (Unbalanced) $C_3H_8 + O_2 \rightarrow CO_2 + H_2O$

1) If you start with 14.8 g of C_3H_8 and 3.44 g of O_2, determine the limiting reagent and excess reagent
2) Determine the number of moles of carbon dioxide produced
3) Determine the number of grams of H_2O produced
4) Determine the number of grams of excess reagent left

Write balanced equation	_____C_3H_8 + _____O_2 → _____CO_2 + _____H_2O		
STEP 1 Grams to Moles	*C_3H_8*	*O_2*	
STEP 2 Check Mole Ratios	*Needed Ratio Amounts from Balanced Equation*	*Ratio with actual molar amounts in the problem*	*Simplified ratio from actual molar amounts for easier comparison*
STEP 3 Identify LR & XR	**1)** Limiting Reagent	**1)** Excess Reagent	
STEP 4 DA with Limiting Reagent	**2)** Moles of CO_2 produced **3)** Grams of H_2O produced		
STEP 5 XS Left: Mole Ratio and then Subtract	*Moles of XS used in reaction found using moles of LR and mole ratio*	*Moles of XS left after rxn = moles of XS at the start minus moles of XS used in reaction.*	
STEP 6 XS Left: Convert to desired unit	**4)** Grams of XS left		

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Given the following equation: (Unbalanced) $Al_2(SO_3)_3$ + NaOH → Na_2SO_3 + $Al(OH)_3$

5) If 10.0 g of $Al_2(SO_3)_3$ is reacted with 10.0 g of NaOH, determine the limiting reagent and the excess reagent
6) Determine the number of moles of $Al(OH)_3$ produced
7) Determine the number of grams of Na_2SO_3 produced
8) Determine the number of grams of excess reagent left over in the reaction

Write balanced equation	_____$Al_2(SO_3)_3$ + _____NaOH → _____Na_2SO_3 + _____$Al(OH)_3$		
STEP 1 Grams to Moles	*$Al_2(SO_3)_3$*	*NaOH*	
STEP 2 Check Mole Ratios	*Needed Ratio Amounts from Balanced Equation*	*Ratio with actual molar amounts in the problem*	*Simplified ratio from actual molar amounts for easier comparison*
STEP 3 Identify LR & XR	**5)** Limiting Reagent	**5)** Excess Reagent	
STEP 4 DA with Limiting Reagent	**6)** Moles of $Al(OH)_3$ produced **7)** Grams of Na_2SO_3 produced		
STEP 5 XS Left: Mole Ratio and then Subtract	*Moles of XS used in reaction found using moles of LR and mole ratio*	*Moles of XS left after rxn = moles of XS at the start minus moles of XS used in reaction.*	
STEP 6 XS Left: Convert to desired unit	**8)** Grams of XS left		

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Given the following equation: (Unbalanced) Al_2O_3 + Fe ------> Fe_3O_4 + Al

9) If 25.4 g of Al_2O_3 is reacted with 10.2 g of Fe, determine the limiting reagent
10) Determine the number of moles of Al produced
11) Determine the number of grams of Fe_3O_4 produced
12) Determine the number of grams of excess reagent left over in the reaction

Write balanced equation	_____Al_2O_3+ _____Fe → _____Fe_3O_4 + _____Al		
STEP 1 Grams to Moles	*Al_2O_3*	*Fe*	
STEP 2 Check Mole Ratios	*Needed Ratio Amounts from Balanced Equation*	*Ratio with actual molar amounts in the problem*	*Simplified ratio from actual molar amounts for easier comparison*
STEP 3 Identify LR & XR	**9)** Limiting Reagent	**9)** Excess Reagent	
STEP 4 DA with Limiting Reagent	**10)** Moles of Al produced **11)** Grams of Fe_3O_4 produced		
STEP 5 XS Left: Mole Ratio and then Subtract	*Moles of XS used in reaction found using moles of LR and mole ratio*	*Moles of XS left after rxn = moles of XS at the start minus moles of XS used in reaction.*	
STEP 6 XS Left: Convert to desired unit	**12)** Grams of XS left		

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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!

13) When copper (II) chloride reacts with sodium nitrate, copper (II) nitrate and sodium chloride are formed.

- **a)** Write the balanced equation for the reaction given above.
- **b)** If 15g of copper (II) chloride react with 20g of sodium nitrate what is the limiting reagent for the reaction?
- **c)** How much sodium chloride can be formed?
- **d)** How many grams of copper (II) nitrate is formed?
- **e)** How many grams of the excess reagent are left over in this reaction?
- **f)** If 11.3 grams of sodium chloride was actually formed in the reaction, what is the percent yield of this reaction?

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14) 1000 grams of sodium chloride is combined with 2000 grams of barium phosphate

- **a)** Write the balanced equation for the reaction given above.
- **b)** What is the limiting reactant?
- **c)** How many grams of each product are made?
- **d)** How many grams of the excess reagent are left over in this reaction?