

# Limiting Reactant

Name: \_\_\_\_\_

## Part 1: Mole Ratio

1a) Balance this equation:  $\text{N}_2 + \text{H}_2 \rightarrow \text{NH}_3$

b) write the following molar ratios:

$\text{N}_2 / \text{H}_2$     \_\_\_ / \_\_\_

$\text{N}_2 / \text{NH}_3$     \_\_\_ / \_\_\_

$\text{H}_2 / \text{NH}_3$     \_\_\_ / \_\_\_

c) Fill in the table below:

$\text{N}_2$	$\text{H}_2$	$\text{NH}_3$
19 moles		
	15 moles	
		0.78 moles
	3.69 moles	

2) Balance the equation  $\text{Li}_3\text{N} + \text{H}_2\text{O} \rightarrow \text{NH}_3 + \text{LiOH}$

b) write the following molar ratios:

$\text{Li}_3\text{N} / \text{H}_2\text{O}$     \_\_\_ / \_\_\_

$\text{LiOH} / \text{H}_2\text{O}$     \_\_\_ / \_\_\_

c) Fill in the table below:

$\text{Li}_3\text{N}$	$\text{H}_2\text{O}$	$\text{NH}_3$	$\text{LiOH}$
			9 moles
0.5 moles			
		0.97 moles	
	12.7 moles		

## Part 2: Limiting Reactant

3a) Given the following equation:  $2 \text{NaClO}_3 \rightarrow 2 \text{NaCl} + 3 \text{O}_2$ . With 12.00 moles of  $\text{NaClO}_3$  how many moles of  $\text{O}_2$  will produce?

b) If 1.98 moles of  $\text{O}_2$  are formed, how many moles of  $\text{NaCl}$  will also be produced?

4a) For the reaction  $C + 2H_2 \rightarrow CH_4$ , how many moles of hydrogen are required to produce 0.6 moles of methane,  $CH_4$  ?

b) If 5.7 moles of  $CH_4$  are combined with 9.8 moles of  $H_2$ , which reactant would run out first? Show your work or explain your reasoning.

c) If 1.78 moles of  $H_2$  are combined with 0.45 moles of  $CH_4$ , which reactant would run out first? Show your work or explain your reasoning.

5a) Balance:  $\underline{\quad} C_3H_8 + \underline{\quad} O_2 \rightarrow \underline{\quad} CO_2 + \underline{\quad} H_2O$

b) If you start with 4 moles of  $C_3H_8$  and 10 moles of  $O_2$ , determine the limiting reagent. Show your work or explain your reasoning.

c) Which reactant is in excess? How many moles do you actually need?

d) determine the number of moles of carbon dioxide produced

Given the following equation:  $Al_2(SO_3)_3 + 6 NaOH \rightarrow 3 Na_2SO_3 + 2 Al(OH)_3$

a) If 18 moles of  $Al_2(SO_3)_3$  is reacted with 18 moles of  $NaOH$ , determine the limiting reagent

b) Which reactant is in excess? How many moles are in excess?

c) Determine the number of moles of  $Al(OH)_3$  produced.

d) Determine the number of moles of  $Na_2SO_3$  produced.