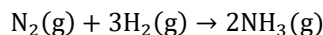


## Gas Law Stoichiometry Extra Practice

### Part 1

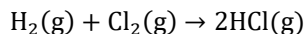
Not all stoichiometry problems have to be limiting reagent problems. If the question defines that one of the reactant is in excess, you are being told that the limiting reagent is the *other* reactant. Use this to solve the first three warm-up problems.



1. When 3.00 moles of  $\text{N}_2$  react with excess hydrogen, how many moles of  $\text{NH}_3$  are formed?
2. When 8.59 moles of  $\text{H}_2$  react with excess  $\text{N}_2$ , how many moles of  $\text{NH}_3$  are formed?
3. How many moles of  $\text{H}_2$  are needed to form 16.7 moles  $\text{NH}_3$  in the presence of excess  $\text{N}_2$ ?

### Part 2

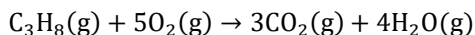
Using the following balanced chemical equation, solve for the total number of moles in the final reaction mixture for each set of starting amounts for the reagents. The reaction is run at 273.15 K and 1 atm pressure.



1. 4.00 moles of  $\text{H}_2$  and 8.00 moles  $\text{Cl}_2$
2. 6.00 moles  $\text{H}_2$  and 4.00 moles  $\text{Cl}_2$
3. 12.0 L  $\text{H}_2$  and 20.0 L  $\text{Cl}_2$

### Part 3

Solve the next three questions using the following balanced chemical equation:



1. 12.6 L of  $\text{C}_3\text{H}_8$  and 25.2 L of  $\text{O}_2$  react to completion. What is the final volume of all gases, assuming constant temperature and pressure?
2. 1.35 moles of  $\text{C}_3\text{H}_8$  and 8.51 moles  $\text{O}_2$  react to completion. What is the final volume if all the gases in the final reaction mixture are carefully stored at 400 K and 2.54 atm?
3. This same reaction is run at a much colder temperature to ensure that the water produced by the reaction is in the liquid phase. Now you react 8.55 L of  $\text{C}_3\text{H}_8$  with 18.5 L  $\text{O}_2$ . What is the total volume of all species in the final reaction mixture?