Stoichiometry Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Worksheet D

Fill in the Blanks

1. \_\_\_\_\_N2 + \_\_\_\_\_\_H2 🡪 \_\_\_\_\_NH3
	1. Nitrogen gas + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 🡪 Ammonia
	2. 1 mol + 3 mol 🡪 \_\_\_\_\_\_\_\_\_\_ mol
	3. \_\_\_\_\_\_\_\_\_\_ grams + 6.0 grams 🡪 34.0 grams
	4. 22.4 Liters + \_\_\_\_\_\_\_\_\_\_ Liters 🡪 44.8 Liters
2. How many mols of ammonia are formed when 5 mols of Hydrogen gas completely react with nitrogen gas?
3. When solid Zinc reacts with hydrochloric acid, zinc chloride and hydrogen gas are produced.
	1. Write out the complete and balanced formula for this reaction.
	2. How many grams of zinc would be needed in this reaction to form 8.63 grams of zinc chloride?
4. Aluminum chloride can be decomposed to form aluminum and chlorine gas.

* 1. How many grams of aluminum can be obtained from the decomposition of 59.34 grams of aluminum chloride.
1. Vinegar (HC2H3O2) and Baking soda (Sodium bicarbonate) reacts to form sodium acetate, carbon dioxide, and water.
	1. If 32.45 grams of baking soda is incorporated into this reaction, how many grams of vinegar would be needed.
2. What volume of hydrogen gas is formed from the decomposition of 156.45 grams of water?
3. How many atoms of copper are replaced by 6.89 grams of iron in the single replacement reaction: Fe + CuSO4 🡪 FeSO4 + Cu
4. When Mg combusts with O2 from the air it produces magnesium oxide. If you start with 2.34 grams of Mg, how many grams of oxygen gas are used in the reaction?
5. The “word” formula, 2.04x1024 atoms of aluminum plus 1.806x1024 molecules of oxygen gas yield 1.204x1024 units of aluminum oxide can be written as
	1. 4Al + 2O2 🡪 4AlO2
	2. 2Al + 2O2 🡪 Al2O4
	3. 4Al + 3O2 🡪 2Al2O3
	4. 4Al + 2O2 🡪 4AlO
6. How many mols of ethane, C2H6, will react with 57 liters of oxygen gas during a combustion reaction which produces carbon dioxide and water?
7. Sodium chloride reacts with 1.4 grams silver nitrate in solution (aq).

NaCl + AgNO3 🡪 AgCl + NaNO3

* 1. Does this replacement reaction occur? How do you know this?
	2. How many grams of silver chloride would be formed if this reaction did occur?
1. In a laboratory 58.70 grams of NaClO3 was heated in order to decompose the compound. How many liters of oxygen gas would be formed?
2. If you have 10.2 grams of calcium hydroxide and 9.8 grams of phosphoric acid, what would be the limiting reagent according to the following chemical reaction
	1. Reaction: Ca(OH)2  + H3PO4 🡪 Ca3(PO4)2 + H2O
	2. Using the limiting reagent, determine how many grams of calcium phosphate could be produced?
	3. How much excess reagent would be left over from this reaction?
3. Lightning in the atmosphere can cause nitrogen and oxygen gases to convert to dinitrogen pentoxide. How many liters of nitrogen gas would be needed to make 10 liters of dinitrogen pentoxide?
4. If you add 55 grams of calcium chloride to 92 grams of silver nitrate, how many grams of silver chloride will be made? (double replacement reaction)
5. Aluminum and sulfur react to form aluminum sulfide.
	1. How many grams of sulfur would be needed to react completely with 15.6 grams of aluminum?
	2. How many grams of aluminum sulfide could be made?

1. 50.0 grams of hydrogen react with 5.00 liters of oxygen to form water.
	1. Which is the limiting reagent?
	2. How much excess reactant is left over from the reaction?
	3. How many grams of product can be produced?