STOICHIOMETRY: MOLE-MOLE PROBLEMS

Name _____

1. $N_2 + 3H_2 \rightarrow 2NH_3$

   How many moles of hydrogen are needed to completely react with two moles of nitrogen?

   _____

2. $2KClO_3 \rightarrow 2KCl + 3O_2$

   How many moles of oxygen are produced by the decomposition of six moles of potassium chlorate?

   _____

3. $Zn + 2HCl \rightarrow ZnCl_2 + H_2$

   How many moles of hydrogen are produced from the reaction of three moles of zinc with an excess of hydrochloric acid?

   _____

4. $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$

   How many moles of oxygen are necessary to react completely with four moles of propane (C_3H_8)?

   _____

5. $K_3PO_4 + Al(NO_3)_3 \rightarrow 3KNO_3 + AlPO_4$

   How many moles of potassium nitrate are produced when two moles of potassium phosphate react with two moles of aluminum nitrate?

   _____

STOICHIOMETRY: VOLUME-VOLUME PROBLEMS

Name _____

1. $N_2 + 3H_2 \rightarrow 2NH_3$

   What volume of hydrogen is necessary to react with five liters of nitrogen to produce ammonia? (Assume constant temperature and pressure.)

   _____

2. What volume of ammonia is produced in the reaction in Problem 1?

   _____

3. $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$

   If 20 liters of oxygen are consumed in the above reaction, how many liters of carbon dioxide are produced?

   _____

4. $2H_2O \rightarrow 2H_2 + O_2$

   If 30 mL of hydrogen are produced in the above reaction, how many milliliters of oxygen are produced?

   _____

5. $2CO + O_2 \rightarrow 2CO_2$

   How many liters of carbon dioxide are produced if 75 liters of carbon monoxide are burned in oxygen? How many liters of oxygen are necessary?

   _____

   _____

STOICHIOMETRY: MASS-MASS PROBLEMS

Name _____

1. $2KClO_3 \rightarrow 2KCl + 3O_2$

   How many grams of potassium chloride are produced if 25 g of potassium chlorate decompose?

   _____

2. $N_2 + 3H_2 \rightarrow 2NH_3$

   How many grams of hydrogen are necessary to react completely with 50.0 g of nitrogen in the above reaction?

   _____

3. How many grams of ammonia are produced in the reaction in Problem 2?

   _____

4. $2AgNO_3 + BaCl_2 \rightarrow 2AgCl + Ba(NO_3)_2$

   How many grams of silver chloride are produced from 5.0 g of silver nitrate reacting with an excess of barium chloride?

   _____

5. How much barium chloride is necessary to react with the silver nitrate in Problem 4?

   _____

STOICHIOMETRY: MIXED PROBLEMS

Name _____

1. $N_2 + 3H_2 \rightarrow 2NH_3$

   What volume of NH_3 at STP is produced if 25.0 g of N_2 is reacted with an excess of H_2?

   _____

2. $2KClO_3 \rightarrow 2KCl + 3O_2$

   If 5.0 g of $KClO_3$ is decomposed, what volume of O_2 is produced at STP?

   _____

3. How many grams of KCl are produced in Problem 2?

   _____

4. $Zn + 2HCl \rightarrow ZnCl_2 + H_2$

   What volume of hydrogen at STP is produced when 2.5 g of zinc react with an excess of hydrochloric acid?

   _____

5. $H_2SO_4 + 2NaOH \rightarrow H_2O + Na_2SO_4$

   How many molecules of water are produced if 2.0 g of sodium sulfate are produced in the above reaction?

   _____

6. $2AlCl_3 \rightarrow 2Al + 3Cl_2$

   If 10.0 g of aluminum chloride are decomposed, how many molecules of Cl_2 are produced?

   _____

STOICHIOMETRY: LIMITING REAGENT

Name _____

1. $N_2 + 3H_2 \rightarrow 2NH_3$

   How many grams of NH_3 can be produced from the reaction of 28 g of N_2 and 25 g of H_2?

   _____

2. How much of the excess reagent in Problem 1 is left over?

   _____

3. $Mg + 2HCl \rightarrow MgCl_2 + H_2$

   What volume of hydrogen at STP is produced from the reaction of 50.0 g of Mg and the equivalent of 75 g of HCl?

   _____

4. How much of the excess reagent in Problem 3 is left over?

   _____

5. $3AgNO_3 + Na_3PO_4 \rightarrow Ag_3PO_4 + 3NaNO_3$

   Silver nitrate and sodium phosphate are reacted in equal amounts of 200. g each. How many grams of silver phosphate are produced?

   _____

6. How much of the excess reagent in Problem 5 is left?

   _____