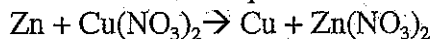


Stoichiometry Quiz

Name KEY

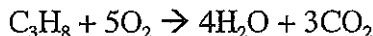
Mole-Mole

1. How many moles of zinc would be required to react with 0.95 moles of copper (II) nitrate?



$$0.95 \text{ mol Cu} \times \frac{1 \text{ mol Zn}}{1 \text{ mol Cu}} = \boxed{0.95 \text{ mol Zn}}$$

2. If you want to produce 25.0 moles of water from the combustion of propane, how many moles of oxygen will need to react?



$$25.0 \text{ mol H}_2\text{O} \times \frac{5 \text{ mol O}_2}{4 \text{ mol H}_2\text{O}} = \boxed{31.25 \text{ mol O}_2}$$

3. The reaction of sodium phosphate with barium chloride produced 0.56 moles of barium phosphate. How many moles of sodium chloride were also produced?



$$0.56 \text{ mol Ba}_3(\text{PO}_4)_2 \times \frac{6 \text{ mol NaCl}}{1 \text{ mol Ba}_3(\text{PO}_4)_2} = \boxed{3.36 \text{ mol NaCl}}$$

Mass-Mass

- 4.) 10.0 grams of heptane (C_7H_{16}) react with oxygen according to the following equation. How many grams of water are formed?

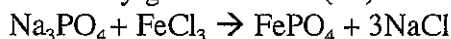


$$10.0 \text{ g C}_7\text{H}_{16} \times \frac{1 \text{ mol C}_7\text{H}_{16}}{100 \text{ g C}_7\text{H}_{16}} \times \frac{8 \text{ mol H}_2\text{O}}{1 \text{ mol C}_7\text{H}_{16}} \times \frac{18 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = \boxed{14.4 \text{ g H}_2\text{O}}$$

- 5.) Use the equation from problem 4. If you make 35.0 grams of water how many grams of oxygen did you use?

$$35.0 \text{ g H}_2\text{O} \times \frac{1 \text{ mol H}_2\text{O}}{18 \text{ g H}_2\text{O}} \times \frac{11 \text{ mol O}_2}{8 \text{ mol H}_2\text{O}} \times \frac{32 \text{ g O}_2}{1 \text{ mol O}_2} = \boxed{85.55 \text{ g O}_2}$$

6.) The reaction of sodium phosphate with iron (III) chloride produces 325.0 grams of iron (III) phosphate. How many grams of iron (III) chloride were reacted?



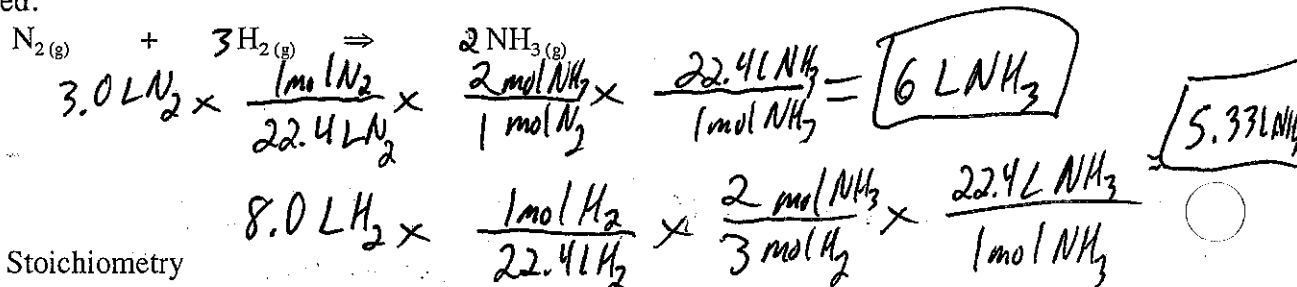
$$325.0 \text{ g FePO}_4 \times \frac{1 \text{ mol FePO}_4}{150.85 \text{ g FePO}_4} \times \frac{1 \text{ mol FeCl}_3}{1 \text{ mol FePO}_4} \times \frac{162.35 \text{ g FeCl}_3}{1 \text{ mol FeCl}_3} = \boxed{349.78 \text{ g FeCl}_3}$$

7. Use equation 6 to answer the following question. If you have 125 gram of iron (III) chloride how much salt could you make?

$$125 \text{ g FeCl}_3 \times \frac{1 \text{ mol FeCl}_3}{162.35 \text{ g FeCl}_3} \times \frac{3 \text{ mol NaCl}}{1 \text{ mol FeCl}_3} \times \frac{58.5 \text{ g NaCl}}{1 \text{ mol NaCl}} = \boxed{135.12 \text{ g NaCl}}$$

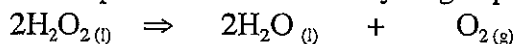
Gas Stoichiometry

8.) If 3.0 liters of N_2 is combined with 8.0 liters of H_2 at STP, according to the equation below, how many liters of NH_3 will be produced? Note: The equation needs to be balanced.



Mixed Stoichiometry

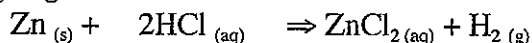
9.) The decomposition reaction for hydrogen peroxide is given below.



How many grams of hydrogen peroxide must be decomposed to produce 5.5 liters of oxygen gas at STP?

$$5.5 \text{ L O}_2 \times \frac{1 \text{ mol O}_2}{22.4 \text{ L O}_2} \times \frac{2 \text{ mol H}_2\text{O}_2}{1 \text{ mol O}_2} \times \frac{34 \text{ g H}_2\text{O}_2}{1 \text{ mol H}_2\text{O}_2} = \boxed{16.69 \text{ g H}_2\text{O}_2}$$

10.) Zinc reacts with hydrochloric acid (HCl) to form aqueous zinc chloride and hydrogen gas.



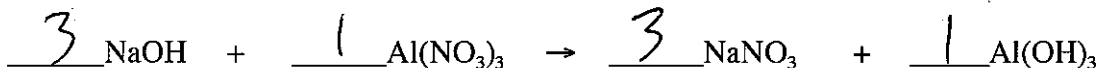
If there are 15.3 grams of HCl available to react at STP, how many liters of hydrogen gas would be produced from this reaction?

$$15.3 \text{ g HCl} \times \frac{1 \text{ mol HCl}}{36.5 \text{ g HCl}} \times \frac{1 \text{ mol H}_2}{2 \text{ mol HCl}} \times \frac{22.4 \text{ L H}_2}{1 \text{ mol H}_2} = \boxed{4.69 \text{ L H}_2}$$

Stoichiometry Practice Test

Name: _____

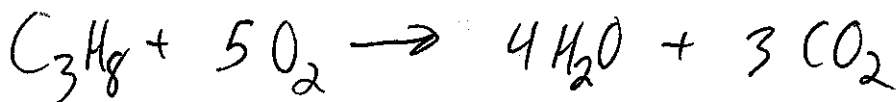
1) What mass of sodium hydroxide is necessary to react completely with 12.3 grams of aluminum nitrate as shown in the following double replacement reaction? Note: you must balance the equation.



6.9 g NaOH

2) Consider the reaction for the combustion of propane (C_3H_8 -- a common BBQ grill fuel).

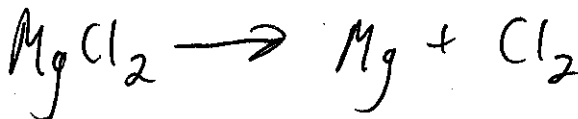
A) Write the balanced equation for this reaction. (hint: in a combustion reaction propane will react with oxygen gas to form two products)



B) Calculate how many liters of carbon dioxide gas are formed from the combustion of 20.0 grams of propane at STP?

30.5 L CO_2

3) A) Write the balanced equation for the decomposition of magnesium chloride.



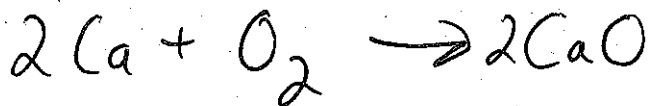
B) If 25.0 grams of magnesium chloride decompose, how many grams of magnesium would form?

6.38 g Mg

C) If in the lab you performed this experiment and formed 5.95 grams of magnesium, what is your percent yield?

$$\frac{5.95 \text{ g Mg}}{6.38 \text{ g Mg}} \times 100\% = 93\%$$

- 4) Consider the synthesis of calcium and oxygen to form calcium oxide.
A) Write the balanced equation for this reaction.



- B) If you react 20.0 grams of calcium and 7.00 liters of oxygen, how many grams of calcium oxide will form (hint: this is a limiting reactant problem)?

28g CaO

35g CaO

- C) Identify the limiting reactant and the excess reactant in the above reaction.

LK = Ca

ER = O₂

- 5) A) Balance the following equation for the single replacement reaction:



- B) How many grams of bromine should form from the reaction of 80.0 grams of potassium bromide and 20.0 grams of chlorine?

53.78g Br₂

45.13g Br₂

- C) If in the lab you performed this experiment, and you were able to collect 41.0 grams of bromine for this reaction, what is your percent yield?

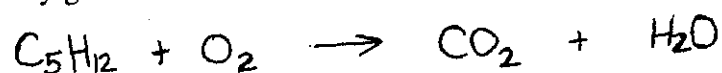
$$\frac{41.0\text{g Br}_2}{45.13\text{g Br}_2} \times 100\% = 90.84\%$$

GENERAL CHEMISTRY – STOICHIOMETRY QUIZ

The reaction of sodium phosphate with aluminum chloride produces 0.66 mole of aluminum phosphate. How many moles of aluminum chloride were reacted?



30.0 grams of pentane (C_5H_{12}) reacts with oxygen according to the following equation. How many grams of carbon dioxide are formed?



How many liters oxygen gas would be produced from the decomposition of 0.750 liters of sulfur trioxide gas?



You are required to produce 25.0 liters of hydrogen gas from the following reaction. How many grams of aluminum would you need to react in order to produce this volume of hydrogen?



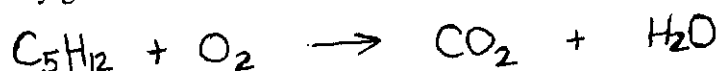
GENERAL CHEMISTRY – STOICHIOMETRY QUIZ

The reaction of sodium phosphate with aluminum chloride produces 0.66 mole of aluminum phosphate. How many moles of aluminum chloride were reacted?



0.66 mol AlCl_3

30.0 grams of pentane (C_5H_{12}) reacts with oxygen according to the following equation. How many grams of carbon dioxide are formed?



91.66 g CO_2

How many liters oxygen gas would be produced from the decomposition of 0.750 liters of sulfur trioxide gas?



1.125 L O_2

You are required to produce 25.0 liters of hydrogen gas from the following reaction. How many grams of aluminum would you need to react in order to produce this volume of hydrogen?



20 g Al