Name: _____

Provide a short and specific definition in YOUR OWN WORDS. Do not use the definition from the book

It should be noted that the chemical formulas and chemical names may not really exist. These chemical formulas and chemical names were created so you could practice using the naming rules.

Additional Notes:

Composition stoichiometry

Reaction stoichiometry _____

Mole ratio

Limiting reactant_____

Excess reactant _____

Theoretical yield

Actual yield

Percent yield _____



Section 9.1

1. Balance and finish (if needed) the following skeletal equations and then write down ALL the mole ratios for the following equations.

a. _____ $H_2 + ___ O_2 \rightarrow ___ H_2O$

b. Al₂(SO₄)₃ + Mg(OH)₂
$$\rightarrow$$

- 2. Write out the skeletal equation, balance, and finish (if needed) the following equations and then write down ALL the mole ratios for the following equations.
 - a. Solid copper reacts with aqueous nitric acid to produce liquid water, solid copper (II) nitrate, and aqueous nitrogen monoxide.

b. Aqueous sodium chromate is mixed with aqueous silver (I) nitrite to produce...

Section 9.2

3. How many moles of solid sodium chloride is produced when 6 moles of solid sodium reacts with excess chlorine gas?

4. How many moles of sodium phosphide are produced when 12 moles of sodium oxide reacts with excess silver (II) phosphide?

- 5. Solid sodium reacts with chlorine gas to produce sodium chloride.
 - a. How many grams of sodium chloride can you produce with 560 grams of sodium?

b. How many grams of sodium chloride can you produce with 560 grams of chlorine gas?

- 6. Iron (II) nitrate reacts with copper (III) oxide to produce Iron (II) oxide and copper (III) nitrate.
 - a. How many particles of Iron (II) oxide are produced from 4567 g copper (III) oxide?

b. How many grams of Iron (II) oxide are produced from 9.3 x 10²² particles of Iron (II) nitrate?

c. How many particles of Iron (II) oxide are produced from 2.55 x 10²⁵ particles of copper (III) oxide?

7. How many grams of NaCl will be produced when 9.6 moles of sodium reacts completely with chlorine gas?

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MrG Mr. Gunkelman 8. How many moles of potassium are produced when 4 moles of potassium nitride decomposes?

9. How many moles of calcium fluoride are produced when 1000 grams of fluoride reacts completely with calcium?

10. How many grams of oxygen are required to completely react with lithium to produce lithium oxide?

11. How many grams of aluminum are required to produce 6.5 moles of aluminum sulfide?

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12. How many moles of hydrogen gas are produce by decomposing 15 moles of water?

- 13. Aqueous sodium chloride reacts and silver nitrate react to produce aqueous sodium nitrate and solid sliver chloride.
 - a. How many grams of sodium chloride are required to produce 15 moles of silver chloride?

b. How many moles of silver nitrate are required to produce 2 moles of silver chloride?

c. How many grams of silver nitrate are produced by 5584 grams of sodium chloride?

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14. How many grams of oxygen gas are produced when 100 grams of water decomposed?

15. How many molecules of mercury (II) sulfate is produced when 5 moles of copper (IV) sulfate reacts with mercury (II) phosphide?

16. How many grams of silver (IV) nitrate are produced when 9.24 x 10²⁴ molecules of silver (IV) phosphate reacts with cobalt (III) nitrate?

17. How many atom of potassium are formed when 45 moles of potassium nitride decomposes?

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Section 9.3

18. Write down the steps to determine the limiting reactant in a reaction.

19. 6 moles of hydrogen gas reacts with 6 moles of oxygen gas to produce water vapor.a. Which of the molecules is the limiting reactant and which is the excess reactant?

Balanced Equation:

20. 6 moles of hydrogen gas reacts with 100 grams of oxygen gas to produce water vapor.a. Which of the molecules is the limiting reactant and which is the excess reactant?

- 21. 6.9 x 10^{24} molecules of hydrogen gas reacts with 150 grams of oxygen gas to produce water vapor.
 - a. Which of the molecules is the limiting reactant and which is the excess reactant?

22. 6 moles of hydrogen gas reacts with 6 moles of oxygen gas to produce water vapor.a. How many moles of water vapor can be produced?

- 23. 6 moles of hydrogen gas reacts with 100 grams of oxygen gas to produce water vapor.
 - a. How many grams of water vapor can be produced?

24. 13 moles of iron (III) oxide reacts with 20 moles of potassium chloride.a. How many grams of potassium oxide can you produce?

b. How many grams of excess reactant do you have left over?

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b. Find the limiting and excess reactants

c. Determine how many moles of Iron (III) product can be produced

d. Determine how many grams of Potassium product can be produced

e. How much Excess reactant is left

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- 26. $1.56 \ge 10^{25}$ particles of sodium carbonate react with 500 grams of magnesium phosphide react to produce...
 - a. Complete and balance the equation
 - b. Find the limiting and excess reactants

c. Determine how many grams of the sodium **product** can be produced

d. Determine how many particles of the magnesium **product** can be produced

e. How much Excess reactant is left



- 27. 9.2 x 10^{19} particles of ammonium sulfate react with 1.2 moles of calcium hydroxide react to produce...
 - a. Complete and balance the equation
 - b. Find the limiting and excess reactants

c. Determine how many grams of the ammonium **product** can be produced

d. Determine how many moles of the calcium **product** can be produced

e. How much Excess reactant is left

28. 1500 grams of sodium phosphide reacts with 125 moles of calcium oxide...

a. Find the limiting and excess reactants

b. Determine how many grams of the sodium **product** can be produced

c. Determine how many moles of the calcium **product** can be produced

d. How much Excess reactant is left

STOP 1

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- 29. 1500 grams of diatomic bromine is added to a container containing 2000 grams of sodium iodide crystals to produce 1500 grams of solid diatomic iodine and another solid
 - a. What is the limiting reactant?

b. What is the theoretical yield of iodine?

c. What is the theoretical yield of the other product?

d. What is the percent yield of iodine?



a. What is the limiting reactant?

b. What is the theoretical yield of sodium sulfate?

c. What is the theoretical yield of the mercury product?

d. What is the percent yield sodium sulfate?

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- 31. 350 grams of solid manganese (II) oxide is placed in 7.5 x 10²⁴ molecules of aqueous hydrochloric acid to produce solid manganese (II) chloride, chlorine gas, and water.
 a. If 1.5 x 10²⁴ molecules of chlorine gas are produced, what is the percent yield?



- 32. 450 grams of solid scandium (II) synthesizes with 2500 grams of liquid diatomic bromine.
 - a. What is the percent yield of the reaction if 2500 grams of the product is produced?



- 33. 1000 grams of magnesium oxide reacts with 400 grams of aluminum in a single replacement reaction.
 - a. What is the percent yield if 600 grams of the aluminum product is produced?