Chemistsry Name: **KEY**

Worksheet – Stoichiometry: Limiting Reagent and Percent Yield # 4

**Directions –** For each question, write and balance the chemical reaction, and perform the requested calculation. SHOW ALL WORK !! Use additional paper if necessary.

1. Iron (III) oxide reacts with aluminum to produce aluminum (III) oxide and iron. If you begin with 1.75 moles of aluminum and 1.5 moles of iron (III) oxide, how many grams of aluminum (III) oxide will be produced ?

2. Methane gas (CH4) burns in diatomic oxygen gas to produce carbon dioxide gas and water vapor. You start with 1.25 moles of methane gas and 2.0 moles of oxygen. If 38 grams of water are collected, what was the percent yield of the reaction ?

3. Aqueous copper (II) nitrate reacts with solid aluminum to produce aqueous aluminum (III) nitrate and solid copper. You begin with 4.5 moles of copper (II) nitrate and 4.0 moles of aluminum. If you produce 250 grams of copper, what was your percent yield ?

4. Solid magnesium burns in diatomic oxygen gas to produce solid magnesium oxide. If you begin with 0.75 moles of magnesium and 0.30 moles of oxygen, how many grams of magnesium oxide will be produced ?

5. Solid chromium reacts with diatomic oxygen gas to produce solid chromium (III) oxide. If you begin with 2.5 moles of chromium and 2.0 moles of oxygen, how many grams of the excess reactant will remain after the reaction ?

6. Solid iron reacts with diatomic oxygen gas to produce iron (III) oxide. You begin with 0.20 moles of iron and 0.18 moles of oxygen. If you produce 12.3 grams of iron (III) oxide, what was your percent yield ?

7. Aqueous silver nitrate reacts with solid copper to produce aqueous copper (II) nitrate and solid silver. If you begin with 4.5 moles of copper and 8.0 moles of silver nitrate, how many grams of the excess reactant will remain after the reaction ?

8. Methane gas (CH4) burns in diatomic oxygen gas to produce carbon dioxide gas and water vapor. If you begin with 0.95 moles of methane and 1.5 moles of oxygen, what mass of carbon dioxide will be produced ?

9. Ethene gas (C2H4) burns in diatomic oxygen gas to produce carbon dioxide gas and water vapor. If you start with 1.5 moles of ethene and 5.0 moles of oxygen, what mass of the excess reactant will remain after the reaction ?

10. Carbon dioxide gas reacts with lithium hydroxide to produce lithium carbonate and water. If you start with 0.95 moles of carbon dioxide and 2.5 moles of lithium hydroxide, how many grams of water are produced ?

11. Sulfuric acid reacts with sodium hydroxide to produce sodium sulfate and water. If you start with 1.9 moles of sulfuric acid and 1.5 moles of sodium hydroxide, how many grams the excess reactant will remain after the reaction ?

12. Acetic acid reacts with sodium bicarbonate to produce sodium acetate, water, and carbon dioxide gas. You start with 2.5 moles of acetic acid and 0.28 moles of sodium bicarbonate. If 11 grams of carbon dioxide are produced, what was the percent yield of the reaction ?

On this page, write down the complete balanced equations from the problems above.

1. Fe2O3 + 2 Al 🡪 Al2O3 + 2 Fe

2. CH4 + 2 O2 🡪 CO2 + 2 H2O

3. 3 Cu(NO3)2 + 2 Al 🡪 2 Al(NO3)3 + 3 Cu

4. 2 Mg + O2 🡪 2 MgO

5. 4 Cr + 3 O2 🡪 2 Cr2O3

6. 4 Fe + 3 O2 🡪 2 Fe2O3

7. 2 AgNO3 + Cu 🡪 Cu(NO3)2 + 2 Ag

8. CH4 + 2 O2 🡪 CO2 + 2 H2O

9. C2H4 + 3 O2 🡪 2 CO2 + 2 H2O

10. CO2 + 2 LiOH 🡪 Li2CO3 + H2O

11. H2SO4 + 2 NaOH 🡪 Na2SO4 + 2 H2O

12. HC2H3O2 + NaHCO3 🡪 NaC2H3O2 + CO2 + H2O