Stoichiometry: Mole Ratios Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Worksheet A

Chemical reactions give information about the amounts of substances in the reaction in units of Moles. The coefficients are the relative amounts of moles of each reactant and product within a chemical reaction.

Example: 2H2 + 1O2 🡪 1H2O

The ratio of H2 : O2 : H2O is equal to 2 : 1 : 1. This means that 2 H2 molecules + 1 O2 molecule yields 1H2O molecule … or, because the mole unit is a set amount (Avogadro’s # of particles), it can also represent the mole ratio 2 mols of H2 molecules + 1 mol of O2 molecules yields 1 mol of H2O molecules.

Directions: For each of the following balanced reactions, calculate how many mols of each product would be produced by complete conversion of **0.15 mols** of the reactant indicated in **bold**. Write the mole ratio used for the conversion.

1. **2 Mg(s)** + O2(g)  🡪 2MgO(s)

mol ratio = 2:1:2 0.15 mols Mg : 0.075 mols O2 : 0.15 mols MgO

**0.15 mols Mg** : 0.15 mols MgO

1. 2 Mg(s) + **O2(g)** 🡪 2MgO(s)
2. **4 Fe(s)** + 3 O2(g)  🡪 2Fe2O3(s)
3. 4 Fe(s) + **3 O2(g)** 🡪 2Fe2O3(s)

Directions: For each of the following balanced reactions, calculate how many mols of each product would be produced by complete conversion of **0.50 mols** of the reactant indicated in **bold**. Write the mole ratio used for the conversion.

1. **2 H2O2(l)** 🡪 2H2O(l) + O2(g)
2. **2 KClO3(s)** 🡪 2KCl(s) + 3 O2(g)
3. **2 Al(s)** + 6 HCl(aq)   🡪 2AlCl3(aq) + 3 H2(s)
4. **1 C3H8(g)**+ 5 O2(g)  🡪 3 CO2(g) + 4 H2O(g)

Directions: For each of the following balanced reactions, calculate how many mols of each product would be produced by complete conversion of **1.25 mols** of the reactant indicated in **bold**. Write the mole ratio used for the conversion.

1. **2 C2H5OH(l)** + 6 O2(g)  🡪 4CO2(g) + 6 H2O(g)
2. **1 N2(g)** + 1 O2(g)  🡪 2NO(g)
3. **\_\_\_\_\_NaClO2(s)** + \_\_\_\_\_Cl2(g)  🡪 \_\_\_\_\_ClO2(g) + \_\_\_\_\_NaCl(s)
4. **\_\_\_\_\_H2(g)** + \_\_\_\_\_N2(g)  🡪 \_\_\_\_\_NH3(g)

Directions: For each of the following balanced reactions, calculate how many mols of each product would be produced by complete conversion of **2.75 mols** of the indicated substance in **bold**. Write the mole ratio used for the conversion.

1. **\_\_\_\_\_C2H6(g)** + \_\_\_\_\_O2(g)  🡪 \_\_\_\_\_H2O(l) + \_\_\_\_\_CO2(g)
2. \_\_\_\_\_SnO2(s) + \_\_\_\_\_H2(g)  🡪 **\_\_\_\_\_ Sn (s)** + \_\_\_\_\_H2 O(s)
3. **Aluminum(s)** + Oxygen(g)  🡪 Aluminum Oxide(s)
4. Auric Sulfide(s) + Hydrogen(g)  🡪 **Gold(s)** + Hydrosulfic Acid(g)