CW: Limiting Reactants

Name: Period: 2 3

Directions: Use stoichiometry to solve these limiting reactant problems.

1. 30.0 g of sodium metal reacts with 90.0 g of chromium (III) cyanide solution to produce solid chromium and a solution of sodium cyanide.

**Na (s) + Cr(CN)3 (aq) → Cr (s) + NaCN (aq)**

* 1. Determine which reactant is the limiting reactant.
  2. Which reactant is the excess reactant?
  3. What is the theoretical yield, in grams, of chromium produced?
  4. If 20.0 g of chromium is actually produced, what is the percent yield?

1. 40.0 g of a solution of sulfuric acid reacts with 40.0 g of solid sodium hydroxide to produce water and a solution of sodium sulfate.

**H2SO4 (aq) + NaOH (s) → H2O (l) + Na2SO4 (aq)**

* 1. Which reactant is the limiting reactant?
  2. Which reactant is the excess reactant?
  3. What is the mass of water theoretically produced?
  4. If 11.1 g of water is actually produced, what is the percent yield?

1. 684.68 g of sucrose (C12H22O11) is burned in the presence of 700.00 g oxygen gas to produce carbon dioxide gas and water vapor.

**C12H22O11 (s) + O2 (g) → CO2 (g) + H2O (g)**

* 1. Which reactant is the limiting reactant?
  2. Which reactant is the excess reactant?
  3. What is the mass of water theoretically produced?
  4. If 301.00 g of water is actually produced, what is the percent yield?
  5. Extra Credit:
     1. What is the mass of carbon dioxide theoretically produced?
     2. What mass of the excess reactant was used along with all of the limiting reactant?
     3. What mass of the excess reactant was left over after the reaction?