Worksheet: Limiting Reactants **Name** *KEY*

1. BALANCE the equation first. $4\ FeCl_3 + 3\ O_2 \rightarrow 2\ Fe_2O_3 + 6\ Cl_2$

   a. How many moles of chlorine gas can be produced if 4 moles of $FeCl_3$ react with 4 moles of O_2? SHOW ALL WORK!

$$? \text{ mol } Cl_2 = 4 \text{ } \cancel{\text{mol } FeCl_3} \times \frac{6 \text{ mol } Cl_2}{4 \text{ } \cancel{\text{mol } FeCl_3}} = \boxed{6 \text{ mol } Cl_2}$$

$$? \text{ mol } Cl_2 = 4 \text{ } \cancel{\text{mol } O_2} \times \frac{6 \text{ mol } Cl_2}{3 \text{ } \cancel{\text{mol } O_2}} = 8 \text{ mol } Cl_2$$

   b. What is the limiting reactant?

$$FeCl_3$$

   c. What is the excess reactant?

$$O_2$$

2. Use the following BALANCED equation.

$$2\ C_2H_6 + 7\ O_2 \rightarrow 4\ CO_2 + 6\ H_2O$$

   a. If 15 g of C_2H_6 react with 45 g of O_2, how many grams of water will be produced?

$$? \text{ g } H_2O = 15 \text{ } \cancel{\text{g } C_2H_6} \times \frac{1 \text{ } \cancel{\text{mol } C_2H_6}}{30.0 \text{ } \cancel{\text{g } C_2H_6}} \times \frac{6 \text{ } \cancel{\text{mol } H_2O}}{2 \text{ } \cancel{\text{mol } C_2H_6}} \times \frac{18.0 \text{ g } H_2O}{1 \text{ } \cancel{\text{mol } H_2O}} = 27 \text{ g } H_2O$$

$$? \text{ g } H_2O = 45 \text{ } \cancel{\text{g } O_2} \times \frac{1 \text{ } \cancel{\text{mol } O_2}}{32.0 \text{ } \cancel{\text{g } O_2}} \times \frac{6 \text{ } \cancel{\text{mol } H_2O}}{7 \text{ } \cancel{\text{mol } O_2}} \times \frac{18.0 \text{ g } H_2O}{1 \text{ } \cancel{\text{mol } H_2O}} = \boxed{22 \text{ g } H_2O}$$

   b. What is the limiting reactant?

$$O_2$$

   c. What is the excess reactant?

$$C_2H_6$$