$$\% \text{ yield} = \frac{\text{actual yield}}{\text{Theoretical yield}} \times 100$$

5) Calculate the percent yields in each of the following cases:
   a. Theoretical yield 50.0 g of product; actual yield 41.9 g
   b. Theoretical yield is 290 kg of product; actual yield is 270 kg
   c. Theoretical yield is 64 kg of product; actual yield is 324 g

a.) $\frac{41.9\text{ g}}{50.0\text{ g}} \times 100 = 83.8\%$

b) $\frac{270\text{ kg}}{290\text{ kg}} \times 100 = 93.1\%$

c) $\frac{324\text{ g}}{64000\text{ g}} = 0.5\%$

6) $HgO + 2Cl_2 \text{ -----} \rightarrow HgCl_2 + Cl_2O$

What is the percent yield, if the quantity of reactants is sufficient to produce 0.86 g of Cl_2O but only 0.71 g is obtained?

$\frac{0.71\text{ g}}{0.86\text{ g}} \times 100 = 82.5\%$

7) Using the following reaction:

$C_2H_2 + 2Br_2 \text{ ---} \rightarrow CHBr_2CHBr_2$

If 72.0 g of C_2H_2 reacts with 23.5 grams of excess bromine and 729 g of the product is recovered, what is the percent yield of the reaction?

Must find theoretical yield

mass → mass

$\frac{729\text{ g}}{957.0\text{ g}} = 76.1\%$

$72.0\text{ g } C_2H_2 \left| \frac{1\text{ mol } C_2H_2}{26\text{ g } C_2H_2} \right| \frac{1\text{ mol } C_2HBr_2}{1\text{ mol } C_2H_2} \left| \frac{345.6\text{ g Prod}}{1\text{ mol Prod}} \right| = 957.0\text{ g Prod}$

8) Using the following equation: $2As_2O_3 + 3C \text{ ---} \rightarrow 3CO_2 + 4As.$

If 8.87 g of As_2O_3 is used in the reaction and 5.33 g of As is produced, what is the percent yield?

Must find theoretical yield

$\frac{5.33\text{ g}}{6.21\text{ g}} = 85.8\%$

$8.87\text{ g } As_2O_3 \left| \frac{1\text{ mol } As_2O_3}{197.8\text{ g } As_2O_3} \right| \frac{2\text{ mol As}}{1\text{ mol } As_2O_3} \left| \frac{74.9\text{ g As}}{1\text{ mol As}} \right| = 6.21\text{ g As}$

9) Using the following reaction: $CS_2 + 3Cl_2 \text{ ---} \rightarrow CCl_4 + S_2Cl_2$

If 4.3 moles of CS_2 were to react with 5.6 moles Cl_2, what is the limiting reactant?

The above reaction produced 211 g CCl_4, what is the percent yield?

1) $4.3\text{ mol } CS_2 \left| \frac{3\text{ mol } Cl_2}{1\text{ mol } CS_2} \right| = 12.9\text{ mol } Cl_2$

$5.6\text{ mol } Cl_2 \left| \frac{1\text{ mol } CS_2}{3\text{ mol } Cl_2} \right| = 1.86\text{ mol } CS_2$

2) $5.6\text{ mol } Cl_2 \left| \frac{1\text{ mol } CCl_4}{3\text{ mol } Cl_2} \right| \frac{153.6\text{ g } CCl_4}{1\text{ mol } CCl_4} = 286.72\text{ g } CCl_4$