

% Yield

either determined
in lab or given to you

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

found by doing stoichiometry



GIVEN What is the theoretical yield of HF when 3.80 g of fluorine reacts w/ excess hydrogen? If 3.00 g of hydrofluoric acid is actually made in lab, what is the % yield?

$$\frac{3.80 \text{ g F}_2}{38.00 \text{ g F}_2} \left| \begin{array}{c} 1 \text{ mol F}_2 \\ 38.00 \text{ g F}_2 \end{array} \right| \frac{2 \text{ mol HF}}{1 \text{ mol F}_2} \left| \begin{array}{c} 20.01 \text{ g HF} \\ 1 \text{ mol HF} \end{array} \right| = \boxed{4.00 \text{ g HF}}$$

TY

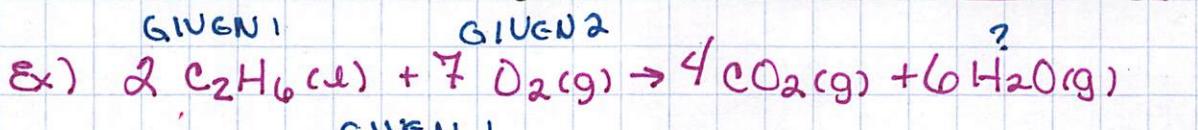
$$\text{M.M. } 2(19.00\text{g}) \\ = 38.00\text{g}$$

~~MM 1.0
19.00
20.019~~

$$\% \text{ yield} = \frac{3.00 \text{ g}}{4.00 \text{ g}} \times 100 = 75\%$$

Limiting Reactants

- reactant that is completely used up first
- controls the amount of product that can be made
- all other reactants are excess reactants



GIVEN 2 If 10.0 g of ethane (C_2H_6) reacts with ?
13.0 g of oxygen gas, what is the theoretical yield of water and which reactant is the limiting reactant?
?

$$\frac{10.0 \text{ g C}_2\text{H}_6}{1 \text{ mol C}_2\text{H}_6} \left| \begin{array}{c} 1 \text{ mol C}_2\text{H}_6 \\ 30.08 \text{ g C}_2\text{H}_6 \end{array} \right| \frac{6 \text{ mol H}_2\text{O}}{2 \text{ mol C}_2\text{H}_6} \left| \begin{array}{c} 6 \text{ mol H}_2\text{O} \\ 1 \text{ mol H}_2\text{O} \end{array} \right| \frac{18.02 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = 18.0 \text{ g H}_2\text{O}$$

$$\frac{13.0 \text{ g O}_2}{1 \text{ mol O}_2} \left| \begin{array}{c} 1 \text{ mol O}_2 \\ 32.00 \text{ g O}_2 \end{array} \right| \frac{6 \text{ mol H}_2\text{O}}{7 \text{ mol O}_2} \left| \begin{array}{c} 6 \text{ mol H}_2\text{O} \\ 1 \text{ mol H}_2\text{O} \end{array} \right| \frac{18.02 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = 6.27 \text{ g H}_2\text{O}$$

$$LR = \text{O}_2$$

$$ER = \text{C}_2\text{H}_6$$

$$TY = 6.27 \text{ g H}_2\text{O}$$

always the
smallest
answer