Today: Finish ch.3 September 18th

Thursday: Problem Club w/ Kendall, Eppley 111, 7:30-9pm

Friday: Start ch.7

Link @ chm 203 website!
* Quizlet flashcards for solubility rules
* Quizlet flashcards for acid nomenclature

$1CH_4 + 4N_2O \longrightarrow 4N_2 + 1CO_2 + 2H_2O$

Suppose 22.0 g CH_4 is reacted with 179 g N_2O. What is the LR? What is the TY of CO_2 in grams? What mass of the excess reagent is left over?

116.042 g/mol 44.02 g/mol

$1CH_4 + 1N_2O \longrightarrow 4N_2 + 1CO_2 + 2H_2O$

Go Moles! 22.0 g 179 g

1.371 mol 4.066 mol (LR)

$\div 1$ $\div 4$

1.37 1.02

$m_A \xrightarrow{\text{mm}} n_A \xrightarrow{} n_B \xrightarrow{\text{mm}} m_B$

$$TY = \frac{4.066\ \text{mol}\ N_2O}{} \left| \frac{1\ \text{mol}\ CO_2}{4\ \text{mol}\ N_2O} \right| \frac{44.01\ \text{g}}{1\ \text{mol}\ CO_2} = \boxed{44.71\ \text{g}\ CO_2}$$

$$m_{CH_4\ \text{used up}} = \frac{4.066\ \text{mol}\ N_2O}{} \left| \frac{1\ \text{mol}\ CH_4}{4\ \text{mol}\ N_2O} \right| \frac{16.043\ \text{g}\ CH_4}{1\ \text{mol}\ CH_4} = 16.3\ \text{g}\ CH_4$$

$22.0\ \text{g} - 16.3\ \text{g} = \boxed{5.69\ \text{g}\ CH_4}$

September 18th

What is the percent by mass of every element in iron(II) sulfate?

Fe^{2+} SO_4^{2-}

$FeSO_4$

MM

Fe	$55.85\,g \times 1 = 55.85$	$\%\,Fe = 100 \times \frac{55.85}{151.91}$	$= 36.77\%\,Fe$
S	$32.06\,g \times 1 = 32.06$	$\%\,S = 100 \times \frac{32.06}{151.91}$	$= 21.10\%\,S$
O	$16.00\,g \times 4 = 64.00$	$\%\,O = 100 \times \frac{64.00}{151.91}$	$= 42.13\%\,O$
	$151.91\,g/mol$		100%

A sample known to contain Fe, S and O has 36.77% Fe, 21.12% S, and the rest oxygen. What is its simplest formula?

Assume 100 g sample	GO MOLES OF ATOMS	÷ by smallest
36.77 g Fe	$\div 55.85\,g/mol = 0.6584$ mol Fe	$1.00 \rightarrow 1$
21.12 g S	$\div 32.06\,g/mol = 0.6588$ mol S	$1.00 \rightarrow 1$
42.11 g O	$\div 16.00\,g/mol = 2.633$ mol O	$3.99 \rightarrow 4$

$Fe_{1.00}S_{1.00}O_{3.99}$

Ibuprofen contains C, H & O. It is 75.69% C and 8.796% H. What is its formula? → $FeSO_4$

$100\% - 75.69\% - 8.796\% = 15.514\%\,O$

Assume 100 g sample	GO MOLES	÷ by smallest
75.69 g C	$\div 12.011 = 6.302$ mol C	$6.5 \rightarrow 6.5$
8.796 g H	$\div 1.008 = 8.726$ mol H	$8.9 \rightarrow 9$
15.514 g O	$\div 16.00 = 0.9696$ mol O	$1.00 \rightarrow 1$

$C_{13}H_{18}O_2$

September 18th

Fructose is 40.00% C and 6.71% H and the rest Oxygen. It has a MM of 180 g/mol. What is the simplest formula and the molecular formula?

↳ = empirical formula

Assume 100 g sample	GO MOLES!	÷ by smallest
40 g C	÷ 12.011 g/mol C = 3.3303 mol C	1.00 → 1
6.71 g H	÷ 1.008 g/mol H = 6.657 mol H	1.99 → 2
53.29 g O	÷ 16.00 g/mol O = 3.3306 O	1.00 → 1

CH_2O → MM = 30.027 g

↳ 180 g / 30.027 g = 6* → $C_6H_{12}O_6$

Coumadin C, H, O

0.4440 mg Sample → 1.204 mg CO_2 (44.01 g/mol) and 0.2076 mg H_2O (18.016 g/mol)

- 0.3286 g C
- 0.0232 g H
- 0.0922 g O
  ↳ 0.005763 mol O

n_{CO_2} = 0.02736 mol n_{H_2O} = 0.01152 mol

n_C = 0.02736 mol n_H = 0.02305 mol

m_C = 0.3286 g C m_H = 0.0232 g H

	÷ smallest	
0.02736 mol C =	4.750 →	4 3/4 * 4 = 19
0.02305 mol H =	4.000 →	4 * 4 = 16
0.00576 mol O =	1.00 →	1 * 4 = 4

$C_{19}H_{16}O_4$