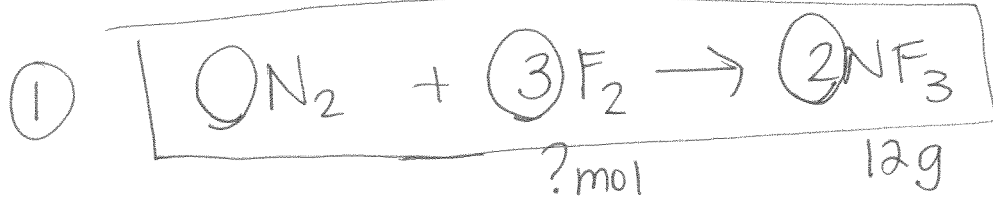


# Stoichiometry HW # 2 (B-C-A)

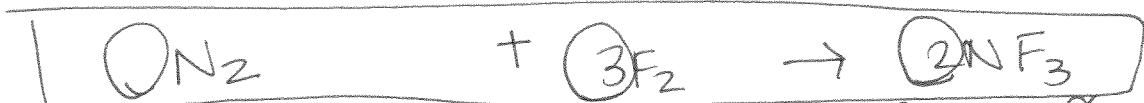


$$\frac{12 \text{ g NF}_3}{71.0 \text{ g NF}_3} \times \frac{1 \text{ mol NF}_3}{1} = 0.17 \text{ mol NF}_3$$



B:	∅		0.17 mol
C:	+0.17 mol	$\left( \frac{3 \text{ F}_2}{2 \text{ NF}_3} \right)$	-0.17 mol
A:	0.26 mol F <sub>2</sub>		∅

②  $\frac{10.0 \text{ g N}_2}{28.02 \text{ g N}_2} \times \frac{1 \text{ mol N}_2}{1} = 0.357 \text{ mol N}_2$



B:	∅		∅
C:	-0.357 mol	$\left( \frac{2 \text{ NF}_3}{1 \text{ N}_2} \right)$	0.357 mol
A:	∅		0.714 mol NF <sub>3</sub>

$$\frac{0.714 \text{ mol NF}_3}{1 \text{ mol NF}_3} \times \frac{71.0 \text{ g NF}_3}{1} = \boxed{50.7 \text{ g NF}_3}$$

# Stoich. HW #2 (B-C-A)

3

$$\frac{4.75 \times 10^{23} \text{ molecules CO}_2}{6.02 \times 10^{23} \text{ molecules CO}_2} \times 1 \text{ mol CO}_2$$

0.789 mol CO<sub>2</sub>



B:  $\begin{array}{ccc} \diagdown & & \diagup \\ \text{CO} & + \text{O}_2 & \text{CO}_2 \\ \diagup & & \diagdown \end{array}$   $\emptyset$  0.789 mol

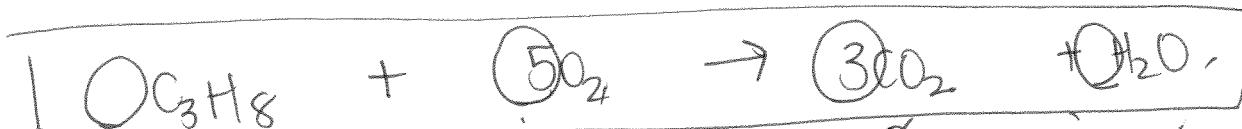
C:  $\begin{array}{ccc} \diagdown & & \diagup \\ \text{CO} & + 0.789 \text{ mol} \left(\frac{1}{2}\right) & \text{CO}_2 \\ \diagup & & \diagdown \end{array}$  -0.789

A:  $\begin{array}{ccc} \diagdown & & \diagup \\ \text{O}_2 & & \text{CO}_2 \\ \diagup & & \diagdown \end{array}$  0.395 mol O<sub>2</sub>  $\emptyset$

$$\frac{0.395 \text{ mol O}_2}{1 \text{ mol O}_2} \times 22.4 \text{ L} = \boxed{8.85 \text{ L O}_2}$$

4

$$\frac{2.5 \text{ L C}_3\text{H}_8}{22.4 \text{ L}} \times 1 \text{ mol} = 0.11 \text{ mol C}_3\text{H}_8$$



B: 0.11 mol  $\begin{array}{ccc} \diagdown & & \diagup \\ \text{C}_3\text{H}_8 & + \text{O}_2 & \text{CO}_2 \\ \diagup & & \diagdown \end{array}$   $\emptyset$  +0.11  $\left(\frac{3}{1}\right)$   $\begin{array}{ccc} \diagdown & & \diagup \\ \text{H}_2\text{O} & & \text{CO}_2 \\ \diagup & & \diagdown \end{array}$

C: -0.11 mol

A:  $\emptyset$  0.33 mol CO<sub>2</sub>

$$\frac{0.33 \text{ mol CO}_2}{1 \text{ mol}} \times 44.01 \text{ g} = 14.5 = \boxed{15 \text{ g CO}_2}$$



B: 2.00 mol Zn

1.00 S<sub>8</sub>

∅

C: -2.00 mol Zn

-2.00 mol Zn  $\left(\frac{1\text{S}_8}{8\text{Zn}}\right)$   
-0.25 mol used

+2.00 mol Zn  $\left(\frac{8\text{ZnS}}{8\text{Zn}}\right)$

A: ∅ mol left

1.75 mol extra S<sub>8</sub>  
(0.25 mol used)

2.00 mol ZnS

a) 2.00 mol ZnS

b) Zn limiting reactant

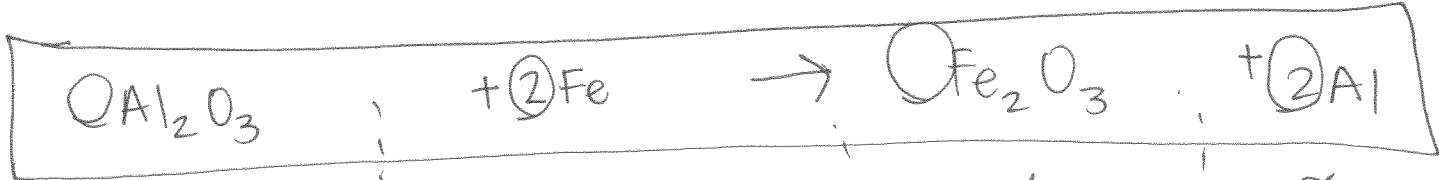
c) % Yield =  $\left(\frac{\text{Actual}}{\text{Theor.}}\right) \times 100 = \left(\frac{1.00}{2.00}\right) \times 100 = \boxed{50.0\% \text{ yield}}$

↑ From work

↙ From Lab

⑥  $\frac{14.7 \text{ g Al}_2\text{O}_3}{101.96 \text{ g}} \times \frac{1 \text{ mol}}{1} = 0.144 \text{ mol Al}$

$\frac{10.2 \text{ g Fe}}{55.85 \text{ g Fe}} \times \frac{1 \text{ mol}}{1} = 0.183 \text{ mol Fe}$



B:	0.144 mol	0.183 mol	∅	∅
C:	-0.144 mol	-0.144 mol $\left(\frac{2 \text{ Fe}}{1 \text{ Al}_2\text{O}_3}\right)$ (0.288 mol not enough)		
C:	0.183 mol $\left(\frac{1 \text{ Al}_2\text{O}_3}{2 \text{ Fe}}\right)$ -0.0915 mol used	-0.183 mol	0.183 mol $\left(\frac{1}{2}\right)$	0.183 mol $\left(\frac{2}{2}\right)$
A:	0.0525 mol left over	∅	0.0915 mol Fe <sub>2</sub> O <sub>3</sub> made	0.183 mol Al made

a)  $\frac{0.183 \text{ mol Al}}{1 \text{ mol Al}} \times 26.98 \text{ g Al} = \boxed{4.94 \text{ g Al}}$  product made

b) limiting reactant = Fe

c)  $\frac{0.0525 \text{ mol Al}_2\text{O}_3}{1 \text{ mol}} \times 101.96 \text{ g} = \boxed{5.35 \text{ g Al}_2\text{O}_3}$  excess

d) % Yield =  $\left(\frac{4.03 \text{ g}}{4.94 \text{ g}}\right) \times 100 = \boxed{81.6\%}$  yield