

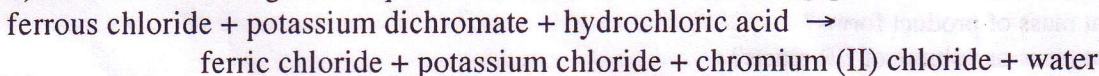
46 Minutes of Stoichiometry Fun!!!

If you can understand these two problems, you are headed in the right direction!!

1.) 10.0 grams of octane are allowed to react with a 95.0 liter volume of air (which is 20% oxygen by volume).

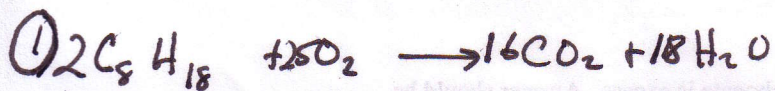
- O_2 A) What is the Limiting Reactant?
 12.22 B) How many liters of carbon dioxide will form (assume STP)?
 11.09 C) How many grams of water will form?
 D) What mass of excess reactant is actually used in the reaction? - 7.73g
 E) What mass of excess reactant is left unused after the reaction is complete? 2.27g
 F) If after conducting this experiment in the laboratory you were able to recover 10.2 grams of water, what is your percent yield for the experiment?

2) Use the following word equation to solve this stoichiometry problem:



14.0 grams of ferrous chloride are allowed to react with 30.0 mL of 0.500 M potassium dichromate and excess hydrochloric acid,

- A) How many grams of chromium (II) chloride will form? 3.38g
 B) How much of the excess reactant remains unused after the reaction? 2.4 ml
 (Note: Answer should be in grams if ferrous chloride is excess. Answer should be in mL if potassium dichromate is excess.)
 C) After performing the experiment described above Suzie was able to collect 2.78 grams chromium (II) chloride. What is her percent yield for the experiment? 82.2%



A) .0877mole C_8H_{18} .848mole O_2

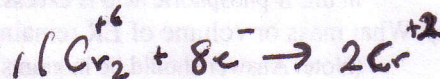
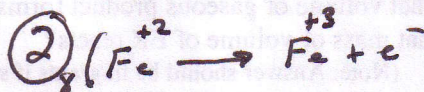
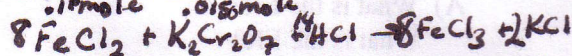
$.0877 \text{ mole } C_8H_{18} \times \frac{25 \text{ mole } O_2}{2 \text{ mole } C_8H_{18}} = 1.10 \text{ mole } O_2 \text{ needed}$

B) $.848 \text{ mole } O_2 \times \frac{16 \text{ mole } CO_2}{25 \text{ mole } O_2} \times \frac{22.4 \text{ L}}{1 \text{ mole}} = 12.2 \text{ L } CO_2$
 you have .84850 O_2 is limiting.

C) $.848 \text{ mole } O_2 \times \frac{18 \text{ mole } H_2O}{25 \text{ mole } O_2} \times \frac{18 \text{ g } H_2O}{1 \text{ mole}} = 11.0 \text{ g } H_2O$

D) $.848 \text{ mole } O_2 \times \frac{2 \text{ mole } C_8H_{18}}{25 \text{ mole } O_2} \times \frac{114 \text{ g}}{1 \text{ mole}} = 7.73 \text{ g}$

E) $10 \text{ g} - 7.73 \text{ g} = 2.27 \text{ g}$



limiting? $.11 \text{ mole } FeCl_2 \times \frac{1 \text{ mole } K_2Cr_2O_7}{8 \text{ mole } FeCl_2} = 0.0138 \text{ mole } K_2Cr_2O_7$

$K_2Cr_2O_7$ is excess

A) $.11 \text{ mole } FeCl_2 \times \frac{2 \text{ mole } CrCl_2}{8 \text{ mole } FeCl_2} \times \frac{123 \text{ g}}{1 \text{ mole}} = 3.38 \text{ g } CrCl_2$

B) $.11 \text{ mole } FeCl_2 \times \frac{1 \text{ mole } K_2Cr_2O_7}{8 \text{ mole } FeCl_2} = 0.0138 \text{ mole } K_2Cr_2O_7 \text{ used}$

$.0150 \text{ mole} - .0138 \text{ mole} = .0012 \text{ mole excess}$
 $.0012 \text{ mole } K_2Cr_2O_7 \times \frac{1 \text{ L}}{5 \text{ mole}} \times \frac{1000 \text{ mL}}{1} = 2.4 \text{ mL}$

C) $\frac{2.78}{3.38} \times 100 = 82.2\%$