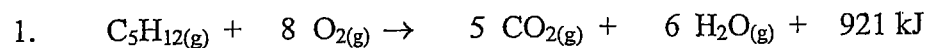


**Show all work. Remember sig figs and unit cancellation.**



a. If you start with 2.14 moles of  $\text{C}_5\text{H}_{12}$  how many moles of carbon dioxide will form?

b. What mass of water is formed from 303 g of  $\text{C}_5\text{H}_{12}$ ?

c. If only 301 g of water formed in question (b) above, determine the % yield.

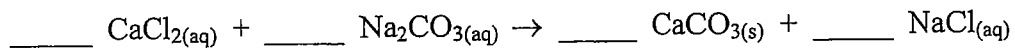
2. Consider the following reaction:

zinc metal reacts with hydrochloric acid to produce hydrogen gas and zinc chloride

a. Write a balanced chemical equation.

b. What mass, in g, of zinc is needed to react with 251.0 mL of a 0.330 M hydrochloric acid solution?

3a. What mass of  $\text{CaCO}_3(\text{s})$  is produced when 25.7 g of  $\text{Na}_2\text{CO}_3$  and 23.5 g of  $\text{CaCl}_2$  are reacted according to the following reaction:



b. What is the limiting reactant in question 3a? \_\_\_\_\_

c. What mass of the excess reactant was left unreacted?

d. If the % yield was only 73.5 %, what mass, in g, of  $\text{CaCO}_3$  actually formed in the lab?

4. You react 14.3 g iron (III) sulphate with 500.0 mL of 0.150 M  $\text{MgCl}_2$ .

a. Write a balanced equation for this reaction. Yes you know how to, think about reaction types!

b. Determine the identity of the limiting reactant. Show all work.

c. Determine the mass of the excess reactant.

Answers: 1a. 10.7 mol  $\text{CO}_2$  b. 455 g  $\text{H}_2\text{O}$  c. 66.2% 2a.  $\text{Zn} + 2 \text{HCl} \rightarrow \text{H}_2 + \text{ZnCl}_2$  b. 2.71 g Zn

3.  $\text{CaCl}_{2(\text{aq})} + \text{Na}_2\text{CO}_{3(\text{aq})} \rightarrow \text{CaCO}_{3(\text{s})} + 2 \text{NaCl}_{(\text{aq})}$  a. 21.2 g  $\text{CaCO}_3$  b.  $\text{CaCl}_2$  c. 3.3 g  $\text{Na}_2\text{CO}_3$  (note the sigfigs...why is it 2 s.f.?)

d. 15.6 g  $\text{CaCO}_3$  4a.  $\text{Fe}_2(\text{SO}_4)_3 + 3 \text{MgCl}_2 \rightarrow 2\text{FeCl}_3 + 3 \text{MgSO}_4$  b.  $\text{MgCl}_2$  c. 4.3 g  $\text{Fe}_2(\text{SO}_4)_3$