Teacher Name: Dibler Student Name: _____

Class : Enhanced NGSS Chemistry

Period : Period 6

Assignment: Assignment Week 5

Due: ***NA***

Stoichiometry *(limiting reactants, Theoretical yeild and percent yield)*

General Instructions:

Please do the activities for each day as indicated. You will work the problems on separate sheets of paper as necessary that you will attach to the completed packet that you submit. Be sure your name is on all sheets of paper. Follow your individual teachers' instructions for turning in work

Submitted Work:

1) Reading notes from section 9.3
2) Completed practice problems and section assignments for each day given below

Questions:

1) Please send email as you have questions and/or attend virtual office hours.

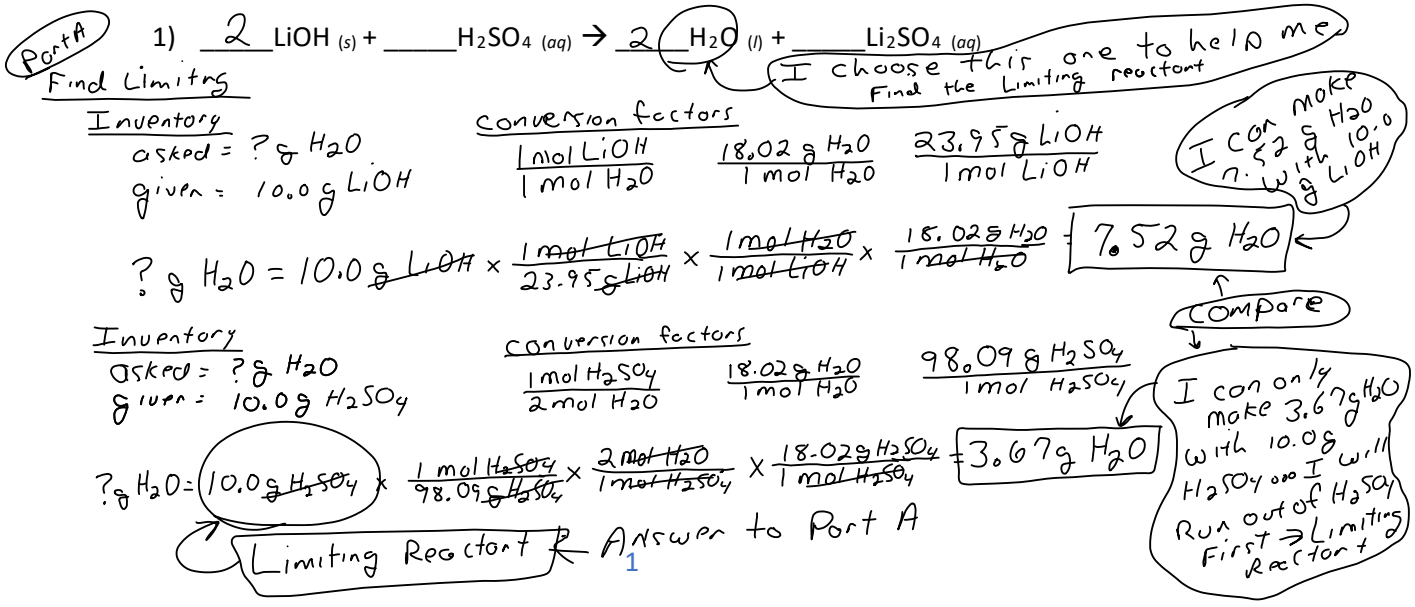
Date	Activity
Monday (5/18)	Read Section 9.3 Take reading notes. Be able to work through all sample problems.
Tuesday (5/19)	Practice Problem 1 a, b, c (page 313 of text) *show all of your work*
Wednesday (5/20)	Practice Problems 1 & 2 (page 315 of text) *show all of your work*
Thursday (5/21)	Practice Problems 1 & 2 (page 318 of text) *show all of your work*
Friday (5/22)	Section Review Problems 2 & 3 (page 318 of text) *show all of your work*

Teacher eddition of book to check your answers:
http://rdibler.net/Chemistry/Distance%20Learning/Modern%20Chem%20Ch%209%20Teacher.pdf

Examples and set ups *(how to show your work)*

Limiting reactants, Theoretical yeilds, Percent yeilds

1. Balance the following equations.
   - Given 10.0 grams of **each** reactant:
     - Part A → ✓ Which of the reactants is the limiting reactant?
     - Part B ↘ ✓ Theoretically How many grams of each product could be produced?



Part B → now that I know H_2SO_4 is my Limiting reactant, I will use it to find out How many g of product can be made... oh ya... I did H_2O already, so only have to find Li_2SO_4

Inventory
asked = ? g Li_2SO_4
given = 10.0 g H_2SO_4

Conversion factors
$\frac{98.09\ g\ H_2SO_4}{1\ mol\ H_2SO_4}$ $\frac{1\ mol\ H_2SO_4}{1\ mol\ Li_2SO_4}$ $\frac{109.95\ g\ Li_2SO_4}{1\ mol\ Li_2SO_4}$

$$?\ g\ Li_2SO_4 = 10.0\ g\ H_2SO_4 \times \frac{1\ mol\ H_2SO_4}{98.09\ g\ H_2SO_4} \times \frac{1\ mol\ Li_2SO_4}{1\ mol\ H_2SO_4} \times \frac{109.95\ g\ Li_2SO_4}{1\ mol\ Li_2SO_4} = 11.2\ g\ Li_2SO_4$$

Part A: H_2SO_4 is Limiting Reactant (I will Run out of it first)
Part B: With 10.0 g H_2SO_4 I will be able to make 3.67 g H_2O and 11.2 g Li_2SO_4

So… How much LiOH will I have left over (in excess)? *I pick one of my products…see how much LiOH is needed to make that amount and subtract that amount from my starting mass of LiOH (10.0g)*

Inventory
asked = ? g LiOH
given = 3.67 g H_2O

Conversion factors
$\frac{18.02\ g\ H_2O}{1\ mol\ H_2O}$ $\frac{23.95\ g\ LiOH}{1\ mol\ LiOH}$ $\frac{1\ mol\ LiOH}{1\ mol\ H_2O}$

$$?\ g\ LiOH = 3.67\ g\ H_2O \times \frac{1\ mol\ H_2O}{18.02\ g\ H_2O} \times \frac{1\ mol\ LiOH}{1\ mol\ H_2O} \times \frac{23.95\ g\ LiOH}{1\ mol\ LiOH} = 4.88\ g\ LiOH$$ needed to make products

10.0 g LiOH Total
− 4.88 g LiOH needed (I run out of H_2SO_4)
5.12 g LiOH Left over (in excess)

So… Lets say I did the experment and I actually made 10.8 g Li_2SO_4. What was my percent yeild? (10.8 g from the problem)

$$\text{percent yeild} = \frac{actual\ yeild}{Theoretical\ yeild} \text{X100}$$

(Theoretical yeild: From calculation in Part B above)

$$\%\ yeild = \frac{10.8\ g\ Li_2SO_4}{11.2\ g\ Li_2SO_4} \times 100 = 96.4\ \%\ yeild$$

So… Lets say that this was the last problem set for 2020 Enhanced Chemistry…Ya!!