

Good Morning

- Please take a moment and check your answers to the homework problems.
- Grab a whiteboard and write the problem(s) that you would like to see solved the most.
- Hand in Hydrate lab if you have not done so already.

Requested HW

Today

- A few problems with limiting and excess reactants.
- Lab review.
- Percent Yield.

Homework

- Limiting Reactant Worksheet.
- There are 5 problems.
- I will show you the answers to the first 3 tomorrow, so that if you had trouble you can try to correct the others over the weekend.

Days Ahead

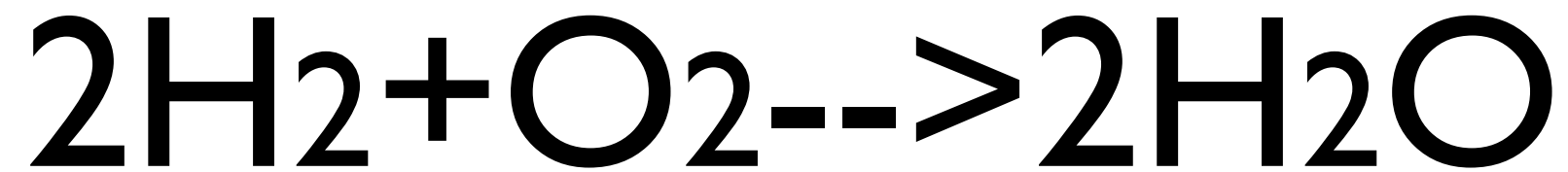
- Friday: Stoichiometry lab II.
- Monday: General review of all of stoichiometry.
- Tuesday: Stoichiometry Quiz.
- Wednesday: Core II: Stoichiometry
- Thursday: Review of Chapters 1-12.
- Flaming bubbles!!

Ch. 11 Quizzes

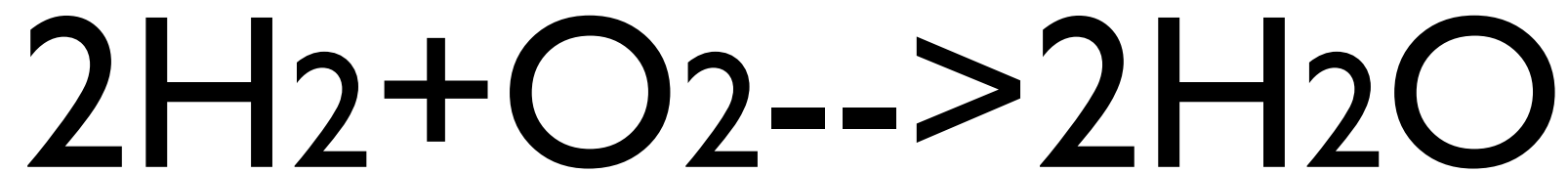
- Page 1 looked really good!
- I will have them on IC by Friday night at the latest.

Limiting and Excess Reactants

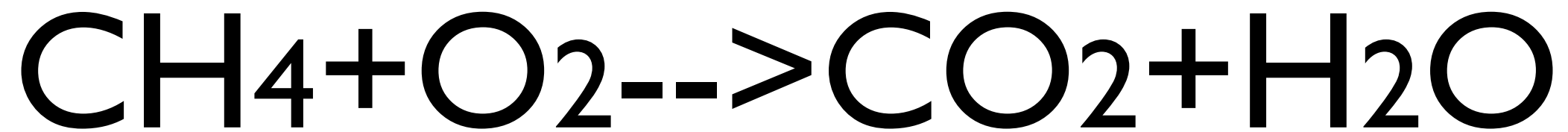
- What are you going to run out of first? This **limits** the reaction from continuing.
- This is based on the balanced equation and the number of moles of each reactant needed for the reaction.



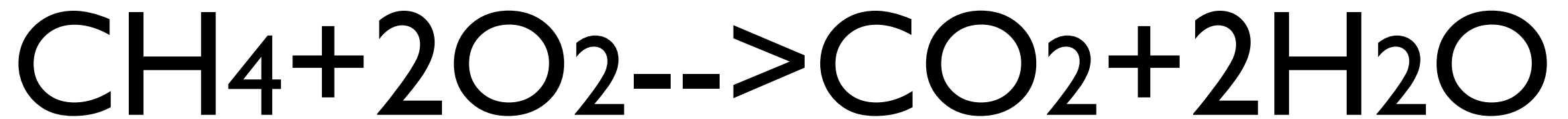
- I need twice as many moles of hydrogen gas as I need oxygen gas in this reaction.



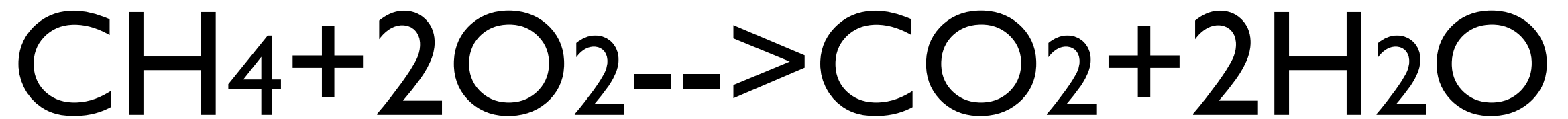
- If I have 1.4 moles of hydrogen and 0.8 moles of oxygen, what will I run out of first?
- How many moles of water are formed?
- What is the volume of excess reactant after the reaction?



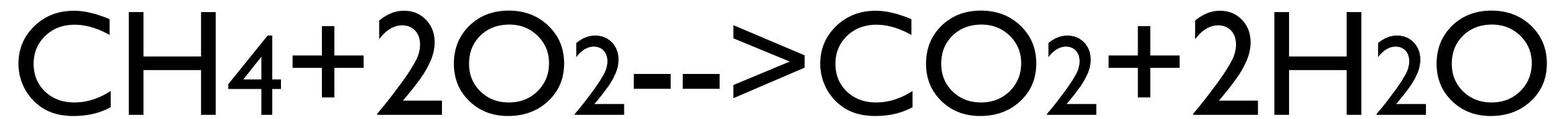
- If I have 17g of methane and 40L of oxygen gas, what mass of water is formed in the reaction?
- Step 1: balance the equation.



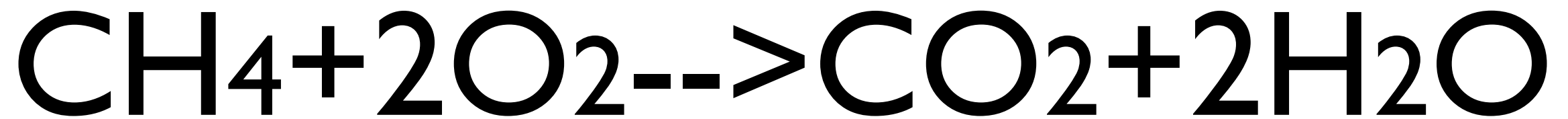
- If I have 17g of methane and 40L of oxygen gas, what mass of water is formed in the reaction?
- Step 2: Convert knowns to moles.



- If I have 17g of methane and 40L of oxygen gas, what mass of water is formed in the reaction?
- Step 3: determine the mole ratio.



- If I have 17g of methane and 40L of oxygen gas, what mass of water is formed in the reaction?
- Step 4: Divide the moles of the substance by its coefficient.
- The smaller result is the limiting reactant.



- If I have 17g of methane and 40L of oxygen gas, what mass of water is formed in the reaction?
- Final step: Use the original moles of the limiting reactant to solve for the unknown quantity.

Hydrate Lab

- You saw the color change from blue to a pale white powder in the lab.
- Let's see what happens when we reintroduce a little water to the anhydrous sample.
- Get goggles (googles) and a test tube from up front.

Your Turn

- 2g of silver nitrate are dissolved in water. 5g of copper are introduced. There is a double replacement reaction where copper(II)nitrate is formed along with silver metal.
- What is the mass of silver formed?

Step 1

- Write the balanced equation for the reaction.

Step 2

- Determine the number of moles of each reactant.
- Divide that number by the coefficient it has.

Step 3

- Use the limiting reactant to solve the problem for the desired quantity.

Chemical Mining


- We use a lot of energy to get purified substances (chemicals) from nature.
- What if there was a way to purify water by removing these chemicals without electricity?

Damian Palin:

Mining minerals from seawater

TED2012 · 3:01 · Filmed Feb 2012

Subtitles available in 39 languages

 [View interactive transcript](#)



Percent Yield

- It is rare that we get the exact results that we are looking for in the lab.
- We can use stoichiometry to figure out how much of a product we expect.

Calculating % Yield

- How close to the mark were we in our experiment?
- If you get all of the points available on a quiz, that's 100%.
- The same applies in theoretical yield.
- How much of a substance did you get compared to what you could have gotten?

Calculating % Yield

- I have a reaction where I expect to produce 35g of NaCl.
- I actually produce only 32g.
- My percent yield is the actual yield divided by the theoretical yield.
- $32/35 \times 100\% = 91.43\%$

A student combines KCl and MgO in a double replacement reaction. The student uses 3g of KCl and produces 1.6g of MgCl₂. What is the % yield?

- Step 1: Find the mass of MgCl₂ that should be produced using stoichiometry.

A student combines KCl and MgO in a double replacement reaction. The student uses 3g of KCl and produces 1.6g of MgCl₂. What is the % yield?

- Step 2: Compare the actual yield to the theoretical yield.
- % Yield = actual/theoretical x 100%.

A rock band ignites 30g of C_3H_8 during a pyrotechnic display at their concert. 45g of water are produced. Find the % yield of water.

If 17.50 grams of ethane combust in an air filled chamber containing 50.00 grams of oxygen, how many grams of each product will be produced?

