

Chapter 3 (continued)

BCHEM 142
Winter 2013

Hanson Activity 3-3

- Discuss Key Questions, Exercises, Got It!, and Problems of Activity 3-3 with your partner for five minutes.
- The clicker quiz will commence at 8:50 AM sharp.

Clicker quiz

- You may refer to your Hanson workbook
- Answer the questions **individually**
- In each case indicate the **best** answer
- **No** paper responses will be accepted

What does a mole look like?

• C
 • Al
 • I₂
 • Hg
 • Fe
 • S₈

Elements that exist as molecules

How large is a mole?

- Depends on element's density and atomic weight.
- For example: 1 mole of Cu has mass 63.55 g
- The density of Cu is: 8.94 g/cm³
- Volume of 1 mole of Cu is ?
7.11 cm³
- 29.6 cm³/oz , what is the volume in oz?
- Mole of Cu is about 0.24 oz or 0.03 cup.

What amount in moles is represented by 1.50 g of CO₂

- Molecular Weight of CO₂ = ?
- Number of moles = ?
- Number of molecules = ?
- Number of oxygen atoms = ?

With Partner: Exercises 1-3, p. 40

- Do Ex #1 at projector
- Take 2 minutes for exercises 2-3
- What is the answer to Ex 3, p. 40?

Exercises on p.42

- At the projector, what is the molar mass of boron?

↓ = Table 2

Isotope	Atomic Mass (amu)	Percent Abundance
boron-10	10.0129	19.78%
boron-11	11.0093	80.22%

With Partner: Exercises 5-7, page 42

With Partner: Ex 8-9, p. 42




Problems p.44

- Problem 1: just like Ex #4 – work yourself at home.
- Problem 2: Work part 2a with your partners now.

2b: What is the mass of of the product produced?

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Hanson Activity 3-4: Tasks on p.46

Name	Line Structure	Molecular Formula	Mass % Composition	
			C	H
ethene				
propene		C_3H_6	85.63	14.37
1-butene				

Ethene: C_2H_4 85.6% C; 14.4% H

1-butene: C_4H_8 85.6% C; 14.4% H

1-pentene: C_5H_{10} 85.6% C; 14.4% H

Hanson Activity 3-4

- Discuss Key Questions 1-11 on pp 46-48 with your partner for five minutes.

Hanson 3-4

- Are there questions about Key Questions 1-11?
- Work Exercise 1 at the projector
- Carry out Exercise 2 with your partner

Hanson 3-4

- Carry out Problem1, p.49, with your partner

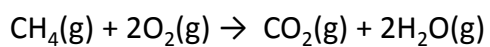
Do problem 3, p. 51 outside of class

- Use the hints on page 52 to develop your strategy.

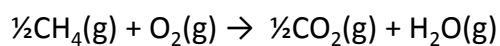
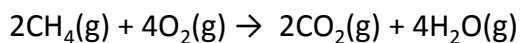
Ch3: Thursday, Jan 24

Balanced Chemical Reactions

- What information does a chemical reaction convey? What is its meaning?
- What does the reaction say about its rate?
- How do we indicate the *physical state* of the reactants and products?
- What must be true due to conservation of mass?



- What interpretations can we give the coefficients?
- How would this change if the water product were liquid water instead?
- Is the following reaction a balanced reaction?

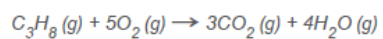


Balance the Following (Hanson 4-1)

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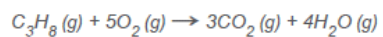
Prob 2, page 57, Hanson 4-1

2. Using the balanced reaction equation for the combustion of propane, determine the number of moles of oxygen that would react with 0.50 mol propane and the number of moles of carbon dioxide that would be produced.



Prob 3, page 57, Hanson 4-1

3. Using the reaction equation for the combustion of propane, determine the number of grams of oxygen that would react with 44 g of propane and the number of grams of water that would be produced.



Hanson Activity 5-1

- Discuss Key Questions 1-11 of Activity 5-1, pages 73 and 75, with your partner for five minutes.
- The clicker quiz will commence in 5 minutes.

Clicker quiz

- You may refer to your Hanson workbook
- Answer the questions **individually**
- In each case indicate the **best** answer
- **No** paper responses will be accepted

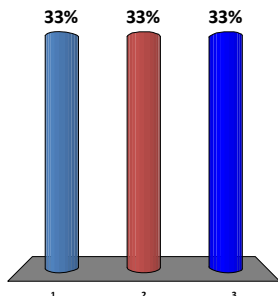
Exercise 1, page 74 at projector

- Recipe: 16 oz butter; 4 eggs; 3c flour, 4c sugar makes 10 doz cookies.
- Express as a reaction equation.
- Which ingredient will be limiting?
- How many cookies can we make?

With your partner, complete Exercises 2 & 3 on page 74.

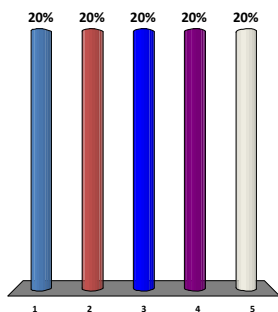
Ex 2b, page 74: Which is the limiting component?

1. Nuts
2. Bolts
3. Washers



Ex 3, page 74: How many water molecules can you produce?

1. 50
2. 100
3. 150
4. 200
5. 300



Any questions about Key Questions, p. 75?

- Work Exercise 4 at projector
 - Mix 6 moles of hydrogen and 4 moles of oxygen to form water.
 - What is the balanced reaction?
 - Which is limiting reagent?
 - How many moles of water are produced?
- With your partner, begin working on Exercises 5-6, pages 75-76.

Ex 5, p. 76: How many moles of water would be produced?

- 0.89 moles water
- 1.73 moles water
- 1.78 moles water

A bar chart with three bars labeled 1, 2, and 3. Each bar has '33%' written above it. Bar 1 is light blue, bar 2 is red, and bar 3 is dark blue.

Ex 6, p. 76: Which is the limiting reactant?

- Hydrogen
- Oxygen

A bar chart with two bars labeled 1 and 2. Each bar has '50%' written above it. Bar 1 is light blue and bar 2 is red.

Ex 6, p. 76: How much water is produced?

- 10.0 grams
- 17.3 grams
- 26.2 grams

A bar chart with three bars labeled 1, 2, and 3. Each bar has '33%' written above it. Bar 1 is light blue, bar 2 is red, and bar 3 is dark blue.

With partner, do problems 1-2 on page 76.

Problem 1, p.76: How many **grams** of cisplatin can be produced?

Continue with Prob 2, page 76

Prob 2, p. 76: How many kilograms of HCN can be produced?

Problem 3-77 from text

- Reaction of barium peroxide to produce hydrogen peroxide:
- $\text{BaO}_2(\text{s}) + \text{HCl}(\text{aq}) \rightarrow \text{H}_2\text{O}_2(\text{aq}) + \text{BaCl}_2(\text{aq})$
- Is it balanced?
- $\text{BaO}_2(\text{s}) + 2 \text{HCl}(\text{aq}) \rightarrow \text{H}_2\text{O}_2(\text{aq}) + \text{BaCl}_2(\text{aq})$

Prob 26, Ch 3

- Eu has two isotopes:
 - ^{151}Eu has mass 150.9196 amu
 - ^{153}Eu has mass 152.9209 amu
 - Average mass of Eu is 151.96 amu
- Calculate natural abundances

Problem 38, Ch3

- Sweetener aspartame is $C_{14}H_{18}N_2O_5$
 - Calculate molar mass of aspartame
 - How many moles in 10.0 g of aspartame?
 - What is the mass of 1.56 mol of aspartame?

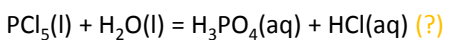
Prob 46, p. 86

- Cyanocobalamin has one Co atom in each molecule.
- It contains 4.34% Co by mass.
- Calculate the molar mass of cyanocobalamin.

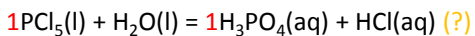
Problem 56, page87

- Maleic acid: 41.39% C, 3.47% H, & rest is O.
- 0.129 mol of maleic acid has mass 15.0 g
- What are empirical and molecular formulas of maleic acid?

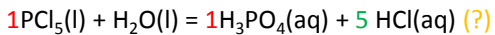
Problem 66d, page 88



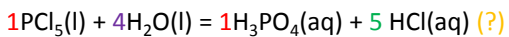
What about P?



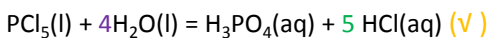
What about Cl?



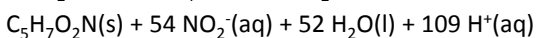
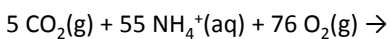
What about O?



What about H?



Problem 72, page 88 of ch 3



- Waste water is 3% ammonium ions
- 95% of ammonium ions are consumed
- How much $\text{C}_5\text{H}_7\text{O}_2\text{N}(\text{s})$ is produced 1.0 x 10⁴ kg of water?
