

Tuesday, Jan 29

- Clicker Quiz on Hanson 5-2 is Later Today
- For the exam on Thursday:
 - Prepare one 4 x 6" card, both sides
 - Bring pencils or blue or black pens – no red ones.
 - Bring a calculator. But, no i-phones, cell phones, laptops, or other such devices are allowed.
 - If you turn up with an emergency (sickness), you must contact me or the Science and Technology Program by email or telephone (425-352-3746) prior to the exam.

Chapter 3 (conclusion)

BCHEM 142
Winter 2013

Any questions about Key Questions, p. 75? (Activity 5-1)

- 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.**

With partner, do problem 1 on page 76.

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

If Pt is limiting reactant, what reactants are in excess?

What is the strategy here?

Work out at projector

Continue with Prob 2, page 76

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

With your partner:
Is the reaction balanced?

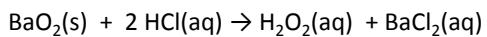
What do we do with the information that we have 100 kg of each reactant?

How do we determine the limiting reactant?

How do we then determine the amount of HCN 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?
- $\text{BaO}_2(\text{s}) + 2 \text{HCl}(\text{aq}) \rightarrow \text{H}_2\text{O}_2(\text{aq}) + \text{BaCl}_2(\text{aq})$



- 1.50 g of barium peroxide treated with 25.0 mL of hydrochloric acid containing 0.0272 g of HCl per mL of solution.
- How much H_2O_2 results?
0.301 g H_2O_2
- How much of either reagent is left unreacted?
 3.6×10^{-2} g HCL

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

Prob 26, Ch 3

24. Let x = % of ^{151}Eu and y = % of ^{153}Eu , then $x + y = 100$ and $y = 100 - x$.

$$151.96 = \frac{x(150.9196) + (100 - x)(152.9209)}{100}$$

$$15196 = (150.9196)x + 15292.09 - (152.9209)x, \quad -96 = -(2.0013)x$$

$$x = 48\%; \quad 48\% \text{ } ^{151}\text{Eu} \text{ and } 100 - 48 = 52\% \text{ } ^{153}\text{Eu}$$

Problem 38, Ch3

- Sweetener aspartame is $\text{C}_{14}\text{H}_{18}\text{N}_2\text{O}_5$
 - 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.

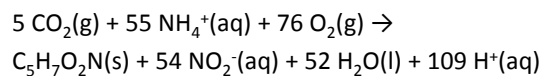
Problem 56, page 87

- 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?

Chloral hydrate $C_2H_3Cl_3O_2$ is a drug.

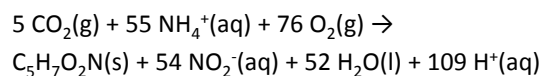
- What mass of chloral hydrate would contain 1.0 g of Cl?
- Molecular weight of chloral hydrate?
165.39 g/mol
- How many grams of Cl per gram of chloral hydrate?
0.643 g Cl/g chloral hydrate
- What mass of chloral hydrate would contain 1.0 g of Cl?
1.6 g chloral hydrate

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 $1.0 \times 10^4 \text{ kg}$ of water?

Problem 72, page 88 of ch 3



$$62. \quad 1.0 \times 10^4 \text{ kg waste} \times \frac{3.0 \text{ kg NH}_4^+}{100 \text{ kg waste}} \times \frac{1000 \text{ g}}{\text{kg}} \times \frac{1 \text{ mol NH}_4^+}{18.04 \text{ g NH}_4^+} \times \frac{1 \text{ mol C}_5\text{H}_7\text{O}_2\text{N}}{55 \text{ mol NH}_4^+} \times$$

$$\frac{113.1 \text{ g C}_5\text{H}_7\text{O}_2\text{N}}{\text{mol C}_5\text{H}_7\text{O}_2\text{N}} = 3.4 \times 10^6 \text{ g tissue if all NH}_4^+ \text{ converted}$$

Because only 95% of the NH_4^+ ions react:

$$\text{mass of tissue} = (0.95)(3.4 \times 10^6 \text{ g}) = 3.2 \times 10^6 \text{ g or } 32 \text{ kg bacterial tissue}$$

Solution concentration and dilution

Ch 4 of Zumdahl

Hanson Activity 5-2

- Discuss Key Questions 1-8 of Activity 5-2, pages 78, with your partner for five minutes.
- The clicker quiz will commence in 5 minutes

Clicker quiz

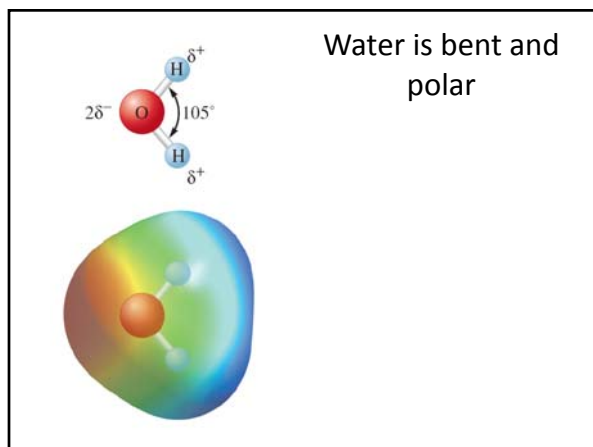
- You may refer to your Hanson workbook
- Answer the questions **individually**
- In each case indicate the **best** answer

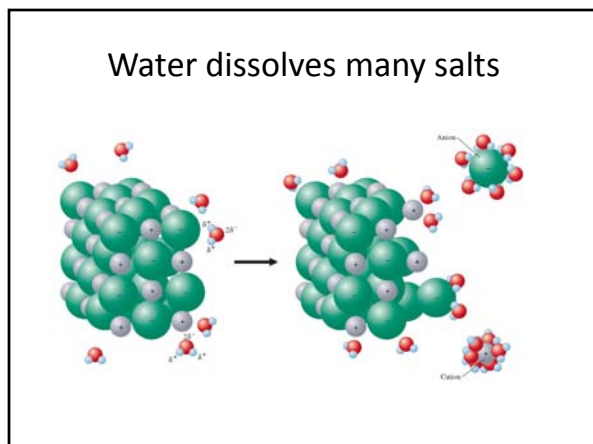
Ex 1 at Projector

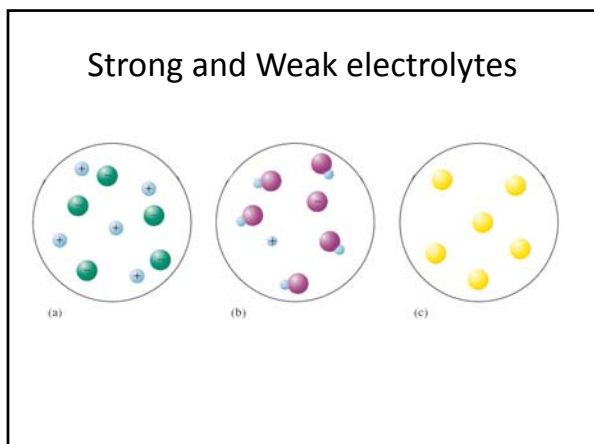
- Calculate the molarity of a 0.175 L sugar solution that was prepared with 0.15 mole of sugar.
- **With your partner, work out Exercises 2-4, page 79.**
- What is the volume of 0.235 M sugar solution that can be prepared with 0.470 moles of sugar? (Ex 2)

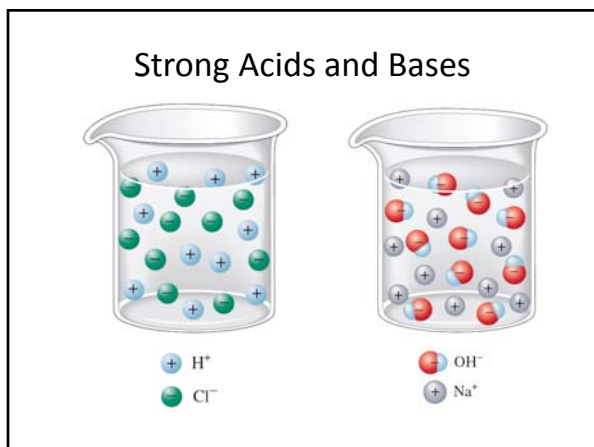
Problem 1, page 80, at Projector

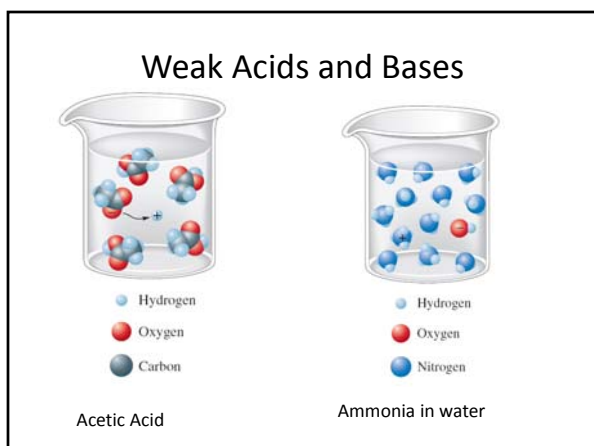
- What volume of 3.15 M NaOH(aq) should be used to prepare 250.00 mL of 0.150 M NaOH(aq)
- 11.9 mL
- Work Problem 2, page 80 with partner.
The concentration ppm means 1 part per million by mass or 1g As in 10^6 g solution.
Assume that density of solution = 1 g/mL

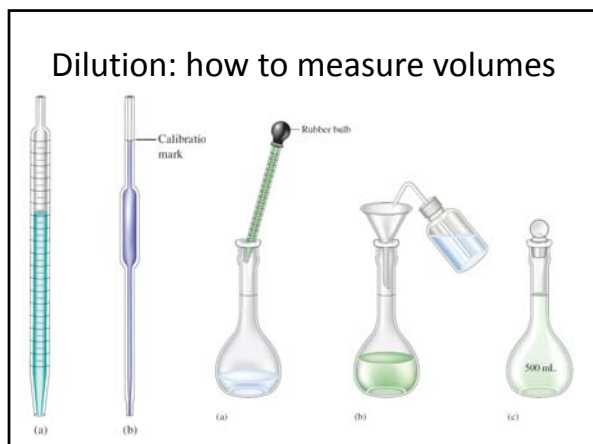












Problem 17-b

- How to prepare 2.00 L of 0.250 M NaOH from 1.00 M NaOH stock solution.
- Add 500 mL of stock solution to a 2.0 L flask, and fill to mark with water.

Problem 17-c

- How to prepare 2.00 L of 0.100 M K_2CrO_4 from solid K_2CrO_4
- Add 38.8 g of K_2CrO_4 to a 2 L flask, dissolve the solid, fill to mark with water, mixing along the way.

Problem 23

- Calculate the Na ion concentration when 70.0 mL of 3.0 M sodium carbonate is added to 30.0 mL of 1.0 M sodium bicarbonate.
- Moles Na ion in solid = 0.42 mol
- Moles Na ion in solution = 0.030 mol
- Total molarity of Na ion: $[\text{Na}^+] = 4.5 \text{ M}$

Problem 27b: Calculate the molarity of:

- 1.0 ppb CHCl_3 in H_2O
-

$8.4 \times 10^{-9} \text{ M}$
