



# CHEMISTRY 104

Lecture Section 4  
MWF 2:25 P.M. Room 1351 Chemistry  
[www.scifun.org](http://www.scifun.org)



1970-2008

General Chemistry: 5 credit hours  
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(Please include your lab section number and your T.A.'s name in your messages to me. You must use your @wisc.edu mailbox. Otherwise I will not respond.)  
Office Hours: Mondays 4:00 - 5:00 p.m. Also, by appointment.  
Students are encouraged to see me immediately after class near the lecture table.



You should obtain a copy of each handout when it is distributed in lecture or from your T.A. Copies of handouts are also available in the General Chemistry Study Room (1371).

**ALWAYS BRING THIS COURSE GUIDE AND SYLLABUS TO CLASS**

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## INTRODUCTION

Chemistry 104 is the second course in a two-semester General Chemistry sequence. The first course is Chemistry 103. Chemistry 103 and 104 are a unit, and students who take Chemistry 104 are presumed to have completed Chemistry 103 (or its equivalent).

**NOTE: If your grade in Chemistry 103 was below C or if you did not take Chemistry 103 at UW-Madison in the fall of 2007, you should review the material the Chemistry 103 fall 2007 syllabus on my Web site as soon as possible to bring your level of competence up to the “acceptable” range. All such students should complete Lessons 5, 6, 9, 10, 12–15 and 37 in the *Workbook for General Chemistry* (see below) within the first two weeks of classes.**

Chemistry 103 and 104 provide a general background in the factual basis and principles of chemistry. The 103-104 sequence is a prerequisite for advanced courses such as Organic Chemistry (341 or 343) and Analytical Chemistry (327 or 329). These General Chemistry courses explore chemical phenomena and principles with emphasis on developing an understanding of chemistry and an appreciation of what chemists do. You must commit yourself to learning the basic vocabulary of chemistry. You will acquire skills in dealing with chemical phenomena and principles and in manipulating mathematical expressions that describe chemical behavior.

I am especially interested in having you develop an informed and sensible attitude toward chemistry in particular and science in general. In addition, I would like you to develop good study habits and skills so that you can fulfill your intellectual and emotional capabilities. Your T.A. and I need to be informed about what is good, bad, and indifferent about what we do.

## CONNECTIONS

In this chemistry course we will encounter and use a robust vocabulary. Several of the words begin with the letter "C" and one of the most significant is: CONNECTIONS. It is important that you strive to make connections among all aspects of the course material: facts, principles, theories, explanations, etc. in order to increase your knowledge and to deepen your understanding of the simple and complex relationships that make chemistry *the*

central science. In fact, chemistry is the science of the familiar as everything around us is made of chemicals, and that includes us.

Often the connections are easy to make, especially if you seek to make them and if you seek help in making them. Mental connections are not always obvious and making them is greatly enhanced by one's eagerness, patience, determination, perseverance, and general emotional readiness to learn. The great joy of making discoveries comes from being focused and from being willing to learn from mistakes without succumbing to frustration.

It is important that you try to make connections, as appropriate, with other course material that you may have had or with what you are learning this semester in your other courses.

In addition, it is very important that you make connections with people and places. Personal connections with fellow students, teachers, experts, advisors, and others in our community will greatly enhance your academic progress and personal maturity. Furthermore, your emotional growth and development will greatly benefit from pursuing the rich offerings available in our community.

## TEXTBOOKS AND OTHER MATERIAL (Required)

1. *Chemistry & Chemical Reactivity*, 6th edition, John C. Kotz, Paul M. Treichel, Jr., and Gabriela C. Weaver, Thomson Brooks/Cole, 2006. (TEXT)
2. *Chemical Equilibrium*, 3rd edition, Bassam Z. Shakhshiri and Rodney Schreiner, Stipes Publishing Co., 2005. (EQUIL)
3. *Chemical Kinetics*, 2nd edition, Bassam Z. Shakhshiri and Rodney Schreiner, Stipes Publishing Co., 2004. (KIN)
4. *Workbook for General Chemistry*, 3rd edition, Bassam Z. Shakhshiri and Rodney Schreiner, Stipes Publishing Co., 2004. (WKBK)
5. *Chemistry 103/104 Laboratory Manual, Fall 2007* or *Chemistry 104 Laboratory Manual, Fall 2007*, Department of Chemistry, University of Wisconsin-Madison.
6. Laboratory Research Pad, carbonless notebook.
7. Safety glasses/goggles. Industrial quality eye protection is *required* in all chemistry laboratories. Safety goggles that fit over regular glasses can be purchased from local bookstores and drugstores.
8. An inexpensive calculator is required. It should have capabilities for square roots, logarithms and inverse logarithms and exponential (scientific) notation operations. The calculator will be used on exams, quizzes, homework assignments and in the laboratory.

## COURSE FORMAT

**LECTURES.** During **Monday/Wednesday** lectures we will discuss principles, outline goals, and present illustrations and demonstrations. Lectures will be given by Professor Shakhshiri and occasionally by Dr. Linda Zelewski. The Friday lecture time is for exams and Cooperative Learning Group sessions (see page 5).

- To prepare for lecture, you should read the suggested readings in the Course Outline starting on page 10 of this syllabus.
- During lecture, take your own thorough notes. Be sure to take effective notes about the demonstrations; the Guidelines for Demonstration Notes on page 9 should help you do this.
- After lecture you should review your notes and study the appropriate readings and work the suggested exercises.
- See page 6 for Helpful Study Hints. (The answers to many of the exercises are provided in the book.)
- In addition, I will suggest exercises in lecture.

**DISCUSSION (QUIZ) SECTION.** A group of 22 or fewer students constitutes a discussion and laboratory section supervised by one Teaching Assistant. Discussion sections are for review and problem solving relevant to the recent lecture material. The sessions include short quizzes to help evaluate your progress. You should be prepared when you come to the discussion class. Ask specific questions of your T.A. Make sure you understand the questions and the answers given by your T.A. and fellow students.

**LABORATORY.** In laboratory you will have the opportunity to experience directly some of the relationships discussed in lectures and in the textbook and to apply experimental techniques to solving chemical problems. Laboratory work is, by nature, slow compared with text reading. You will succeed only with adequate preparation. You must read the experiment and complete the pre-lab assignment **prior** to coming to lab. We encourage you to discuss your work with your fellow students and T.A. while doing the experiment.

## DISCUSSION AND LABORATORY TIMETABLE

761	1:20 TR	2311 Chem	7:45-10:45 W	2325	Craig Tainter	761
762	2:25 TR	2311 Chem	7:45-10:45 F	2325	Craig Tainter	762
763	3:30 TR	2311 Chem	7:45-10:45 W	2325	Lu Wang	763
764	4:35 TR	2311 Chem	7:45-10:45 F	2325	Lu Wang	764
765	11:00 TR	2311 Chem	11:00-2:00 W	2325	Brittland DeKorver	765
766	12:05 TR	2311 Chem	11:00-2:00 F	2325	Brittland DeKorver	766
767	1:20 TR	2307 Chem	11:00-2:00 W	2325	Brittland DeKorver	767
768	2:25 TR	2307 Chem	11:00-2:00 F	2325	Andrew Aring	768
769	2:25 TR	B355 Chem	11:00-2:00 T	2325	Erin Henninger	769
770	4:35 TR	B387 Chem	11:00-2:00 R	2325	Erin Henninger	770
771	2:25 TR	B351 Chem	11:00-2:00 T	2325	Tony Breitbach	771
772	3:30 TR	B351 Chem	11:00-2:00 R	2325	Andrew Aring	772
773	3:30 MW	B387 Chem	2:25-5:25 T	2325	Emily Blanco	773
774	4:35 MW	B387 Chem	2:25-5:25 R	2325	Emily Blanco	774
775	8:50 TR	B355 Chem	2:25-5:25 T	2325	Zhe Wu	775
776	9:55 TR	B355 Chem	2:25-5:25 R	2325	Zhe Wu	776

### E-Mail Addresses for TAs:

Andrew Aring	<i>ajaring@wisc.edu</i>	Erin Henninger	<i>ehenninger@chem.wisc.edu</i>
Emily Blanco	<i>eblanco@chem.wisc.edu</i>	Craig Tainter	<i>ctainter@chem.wisc.edu</i>
Tony Breitbach	<i>abreitbach@wisc.edu</i>	Lu Wang	<i>lwang35@wisc.edu</i>
Brittland DeKorver	<i>brittlandk@chem.wisc.edu</i>	Zhe Wu	<i>zwu7@wisc.edu</i>

## ACADEMIC PERFORMANCE, PROGRESS, AND ACCOMPLISHMENT

In this large course, the students have diverse backgrounds and different expectations. My expectations include individual accomplishment on the part of every student, so that all of you not only fulfill your capabilities, but also expand your capacity and enrich your life. Of great importance to me are the knowledge you acquire, the skills you cultivate, and the attitude you develop. I expect that by the end of the semester each of you will have enough accomplishment to be at least at the ACCEPTABLE level (see page 5). Everything the instructional staff does is aimed toward helping you achieve this goal.

To help you gauge your academic performance and progress I am offering you a collection of learning aids. For example, you should take advantage of the self-paced *Workbook for General Chemistry* (see page 6). The self-paced approach helps you ascertain your own knowledge and level of understanding of chemistry. A similar approach is used in *Chemical Equilibrium* and *Chemical Kinetics*.

Although grades are not the ultimate measure of your knowledge, abilities, or potential, they are useful guides to you and to others. Your level of accomplishment will be recognized at the end of the semester by the letter grade you receive for the course. Individual accomplishment is measured against course standards and not necessarily against the performance of other students. The course standards and levels of accomplishment are:

Percent	Accomplishment Level	Letter Grade
90 - 100	Superior	A
88 - 89	Excellent	AB
80 - 87	Proficient	B
78 - 79	Good	BC
70 - 77	Acceptable	C
60 - 69	Mediocre	D
below 60	Unacceptable	F

**ACADEMIC MISCONDUCT AND CHEATING.** In this course you are encouraged to study and prepare for quizzes and examinations with other students. However, when taking quizzes and examinations, and when writing laboratory reports, you are to work alone. The University regulations are very explicit about academic misconduct and cheating, and these regulations will be fully enforced. During examinations, quizzes and lab reports we will apply a code of honor, under which you are to work alone and neither give nor receive help from any sources. Also, you are expected to help enforce this code.

**GRADES.** Your grades will be based as follows:

3 examinations	36 %
Quizzes	16 %
Laboratory	12 %
Summary (Final) examination	36 %

**EXAMINATIONS.** There will be three mid-term exams of approximately 50 minutes each, given on select Fridays during the scheduled lecture period. At the end of the semester, there will be a 2-hour final examination. Please check the Lecture and Laboratory Schedule (page 13) for the examination dates. The location of each exam will be announced later. If you have a documented disability and a VISA from the McBurney Center regarding exams please notify your TA and myself as early in the semester as possible. **Make-up exams will not be given, nor will it be possible to give any exam outside of its scheduled time.**

**QUIZZES.** Your T.A. will give a quiz during the second of the two weekly discussion sessions. Your T.A. will provide detailed information about this and the conduct of the discussion/laboratory sessions.

**LABORATORY.** The laboratory work is important to understanding and appreciating chemistry. **You must successfully complete the laboratory assignments in order to receive a passing grade in the course.** Exams may include questions based on the laboratory material.

Quiz and lab grades will be normalized to a common scale at the end of the semester to minimize differences in grading practices among the discussion/lab sections. Cumulative course grades will be scaled at the end of the semester, guided by the scale shown above and by class accomplishment.

## LEARNING AIDS

### COOPERATIVE LEARNING GROUPS

Students are asked to form groups of 4-5 students. Groups should sit together in the lecture hall and discussion sessions. Group discussions and assignments may occur during lecture. *Each group may find it helpful to study together outside of class.* This is an excellent use of the Friday 2:25-3:15 p.m. time slot. Group membership is

to be established and identified by Thursday, January 31; see your T.A. for details.

**One of the hallmarks of excellence of UW-Madison is the quality of its students. Share your talents with others and take advantage of the rich talent surrounding you.**

**WORKBOOK FOR GENERAL CHEMISTRY.** The WORKBOOK lessons provide a type of self-tutorial for each topic. These lessons provide you with written instructional materials as well as drill exercises. The format allows you to learn at your own pace by following the illustrations and examples in the Workbook.

**CHEMICAL OF THE WEEK.** To increase your knowledge about chemicals, their properties, production, cost, uses, etc., you will be directed weekly to fact sheets about one or two key chemicals. The information is at [www.scifun.org](http://www.scifun.org). You will be tested on the content of each fact sheet on each exam as well as on the final exam. The schedule of the Chemical of the Week is listed on page 13.

**EXAM STUDY QUESTIONS.** About one week prior to each examination, a list of questions taken from old exams will be distributed. You should answer the questions as part of your review and study for the exam. Compare your solutions and answers with those of fellow students. If your solutions do not agree with those of others, then you should tackle the questions together. (Most, but not all, of the answers will be provided with the questions.)

**STUDY EXERCISES.** Study assignments are given in the Course Outline starting on page 10. You are not required to turn in the assignment; consequently study problems are not graded. You should work out the assigned problems because they are typical of the kinds of problems you are expected to master and handle with ease. If you have questions about the homework assignment, you should seek help from your T.A. in discussion section.

## **ADDITIONAL ACTIVITIES**

**BULL SESSIONS.** These informal sessions are held 1-3 times during the semester. Their aim is to enable the professor to meet students in small groups. The sessions are held in the evening and are open to all those registered in this lecture section and their friends. Topics of discussion are not necessarily related to course materials. Refreshments will be served. The date of each session will be announced one week in advance.

**KEEPING IN TOUCH WITH YOUR INSTRUCTORS.** You should take full advantage of the availability of your lecture professor and your T.A. outside the classroom for face-to-face meetings and e-mail contact. My e-mail address is on the front page of this syllabus. I usually check my e-mail box once a day and attempt to answer my mail promptly. The T.A. e-mail addresses are on page 4.

## **HELPFUL STUDY HINTS**

Read the assignment prior to lecture. Take *good* notes during the lecture (see page 9 of this syllabus for examples). Reread and study the appropriate pages in the textbook. Do the sample exercises in the book. Try the suggested exercises in the book. Also learn the key words and concepts listed on the left-hand side of this syllabus under each unit number. Use the Workbook which accompanies them.

Come to the discussion section prepared. Ask specific questions of your T.A. Make sure you understand the questions of your fellow students and the answers which your T.A. and others give.

Read the experiment. Complete the pre-lab assignment. While in lab, discuss your work with your fellow students and T.A. and complete the laboratory report before leaving unless instructed otherwise by your T.A.

## **UNIVERSITY COUNSELING SERVICE**

**Please take advantage of these services as soon as the need arises. Come and see me as soon as possible regarding the type of help suitable for your needs.**

Individual counseling is available at University Counseling and Consultation Services. For more information call 265-5600 or go to 115 N. Orchard Street, Monday, Tuesday, Thursday and Friday, 8:30 - 5:00 p.m., and Wednesday, 9:00 to 5:00 p.m. or visit their web page at <http://www.uhs.wisc.edu>

**STUDY SKILLS.** Help with self-assessment, test anxiety, problem solving, time scheduling, note taking, exam preparation/taking, reading, efficiency, memory, concentration and procrastination is available through an one-credit course titled "Education Effectiveness" in the School of Education, Department of Counseling Psychology. Interested students should contact the department at 262-0461 to speak with an instructor.

## **WRITING LAB**

As you work on your lab reports I'd encourage you to take advantage of the instruction offered by the University's Writing Lab. Writing lab instructors can help you make your writing the best that it can be. They'll meet with you individually or with your entire group to discuss drafts of your work. They can help you get started as you're generating and organizing ideas. They can give you a critical reaction to a draft—asking questions where ideas aren't clear, pointing out problems in organization and style, and offering advice for revision. For more information see their web page at <http://www.wisc.edu/writing>.

## **GREATER UNIVERSITY TUTORING SERVICE (GUTS)**

GUTS offers free assistance to all enrolled UW-Madison students through a variety of programs. These include study group tutoring, individual tutoring, study skills counseling, exam files and drop-in centers. For more information consult <http://guts.studentorg.wisc.edu/>

## **ALCOHOL AND DRUG ABUSE**

Serious impediments to learning, personal growth and development, and responsible behavior can be caused by alcohol and substance abuse. The notorious national reputation of this Campus in this regard is shameful. Please follow the guidance provided by the Office of the Dean of Students and other officials to help achieve a drug-free environment and to exercise responsible and lawful use of alcoholic beverages.

## **VOTE! VOTE! VOTE! VOTE! VOTE! VOTE! VOTE!**

All eligible voters should exercise their right to vote in this Spring's elections. Our democracy can be effective if all citizens participate responsibly.

The Wisconsin presidential primary is on Tuesday, February 19. The spring election is on Tuesday, April 1. For some students this is your first opportunity to exercise your right to vote. Registering to vote in Wisconsin can be done before or on an election day. To register ahead of time, residents can fill out a form at their municipal clerk's office, either in the city, village or town hall. The Madison city clerk's office is in Room 103 of the City-County Building, 210 Martin Luther King Boulevard. Madison residents also can complete the form at any fire station or public library.

To register on an election day, residents should bring with them a proof of residence to the polls. It should show the resident's name and address. Acceptable proof includes: a Wisconsin driver's license, a library card, a check cashing card, a real estate tax bill, a lease or an identification card from any educational institution.

To find out where to vote (or register) on an election day, look for official notices and maps in the Wisconsin

State Journal, The Capital Times, or the Campus newspapers, usually one day before the election. In addition, residents can call their municipal clerk for voting information. In Madison, the city clerk's number is 266-4601. Dane County residents outside Madison can call the county clerk's office at 266-4121. Information is also available on the web at <http://www.ci.madison.wi.us/clerk/> and <http://www.co.dane.wi.us/coclerk/cchome.htm>.

## GUIDELINES FOR DEMONSTRATION NOTES

These Guidelines should help you take effective notes about the demonstrations Professor Shakhashiri presents during lecture. The demonstrations display phenomena and illustrate principles discussed in the lecture. They are intended to enhance your understanding of the lecture material. Therefore, it is essential that you take accurate and complete notes about the demonstrations.

Three steps are involved in taking good notes about the demonstrations.

1. Describe the equipment and materials at the start of the demonstration. Be sure to include any information Professor Shakhashiri may provide about the equipment and materials.
2. Describe what Professor Shakhashiri does with the equipment and materials.
3. Describe what happens as a result of what Professor Shakhashiri does. Describe the changes that occur during the process, as well as the final condition of the materials.
4. Review your notes and rewrite them when necessary to ensure clarity.

As examples, notes for some lecture demonstrations are included below; they show how a student writes out in fuller comprehensible form the abbreviated notes written down during lecture.

### A. "Bubbles and Fog" Demonstration (Part 1)

1. Describe the equipment and materials at the start of the demonstration. Be sure to include any information Professor Shakhashiri may provide about the equipment and materials.

*4 glass cylinders, each with volume of about 1 liter. One pair of cylinders contains about 800 mL of pink liquid in each cylinder. The other pair contains about 800 mL of purple liquid in each. A bucket of white solid covered with fog. The white solid is dry ice (solid carbon dioxide). Dry ice has a temperature of  $-78^{\circ}\text{C}$ . It sublimates, that is, changes directly from solid to gas.*

2. Describe what Professor Shakhashiri does with the equipment and materials.

*Professor Shakhashiri puts on cloth gloves and drops chunks of dry ice into one of the cylinders of pink liquid and one of the cylinders of purple liquid.*

3. Describe what happens.

*The chunks of dry ice sink to the bottom of the liquids. Bubbles form on the dry ice and rise to the top of the liquids. Fog forms at the tops of the cylinders containing dry ice. The fog spills over the tops of the cylinders and sinks down their sides. The colors of the liquids gradually change: the pink liquid fades to colorless, the purple liquid changes to green and then to yellow. The color changes take about 30 seconds.*

### B. "Bubbles and Fog" Demonstration (Part 2)

1. Describe the equipment and materials at the start of the demonstration.

*5-liter flask of hot water is brought into lecture hall. Brown plastic dish pan. Chunks of dry ice.*

2. Describe what is done with the equipment and materials.

*The hot water is poured into the dish pan. Then, dry ice is poured into the hot water.*

3. Describe what happens.

*Cloud of fog rises to about 2 meters above the pan. Then, the cloud sinks and fog pours over the edge of the pan and onto the floor. The production of fog gradually diminishes and stops after about 3 minutes.*

# COURSE OUTLINE

TEXT = Chemistry & Chemical Reactivity, WKBK = Workbook for General Chemistry  
EQUIL = Chemical Equilibrium, KIN = Chemical Kinetics

## CARBON CHEMISTRY (7 Lectures)

### MOLECULAR STRUCTURES AND ISOMERS

- READINGS – TEXT 11.1  
EXERCISES – TEXT Ch 11: 3, 11, 15, 57, 59 (w/o names)  
WKBK Lessons 32 & 35

### HYDROCARBONS

- READINGS – TEXT 11.2, Appendix E.1  
EXERCISES – TEXT Ch 11: 5, 7, 9, 11, 17, 19, 21, 23, 25, 27, 61, 67, 83  
WKBK Lesson 33 (pp 407 – 419), Lesson 34 (pp 430 – 432)

### ALCOHOLS, ETHERS, & AMINES

- READINGS – TEXT 11.3, Appendix E.2  
EXERCISES – TEXT Ch 11: 31, 33, 35, 37  
WKBK Lesson 33 (pp 419 – 429), Lesson 34 (pp 433 – 434)

### CARBONYL COMPOUNDS

- READINGS – TEXT 11.4  
EXERCISES – TEXT Ch 11: 39, 41, 43, 45, 47, 51, 77  
WKBK Lesson 34 (pp 435 – 444)

## EQUILIBRIUM PRINCIPLES (2 Lectures)

- READINGS – EQUIL pp 1 – 31  
EXERCISES – EQUIL 1.1 – 1.4, 2.1 – 2.4, 3.1 – 3.4  
WKBK Lessons 17 & 6

<b>Exam I Friday, February 22 2:25 – 3:15 p.m.</b>
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## SOLUTION EQUILIBRIA (4 Lectures)

- READINGS – EQUIL pp 32 – 45, 46 – 86  
EXERCISES – EQUIL 4.1 – 4.6, 5.1 – 5.7  
WKBK Lessons 22, 18, 19, 20, 21

## **COORDINATION COMPOUNDS (3 Lectures)**

READINGS – TEXT 22.3 – 22.6

EQUIL pp 87 – 100

EXERCISES – TEXT Ch 23: 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 31, 39, 51, 53

WKBK Lesson 25, 26, 27

## **ELECTROCHEMISTRY (4 Lectures)**

### **ELECTROCHEMICAL CELLS**

READINGS – TEXT 20.2 – 20.4

EXERCISES – TEXT Ch 20: 7, 9, 13, 17, 19, 21, 23, 53, 57, 59

WKBK Lesson 29 (pp 349 – 358)

<b>Exam II Friday, March 28 2:25 – 3:15 p.m.</b>
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### **CONCENTRATION EFFECTS & BATTERIES**

READINGS – TEXT 20.5 – 20.6

EXERCISES – TEXT Ch 20: 11, 25, 27, 29, 33, 35, 37

WKBK Lesson 29 (pp 359 – 364)

### **ELECTROLYTIC CELLS**

READINGS – TEXT 20.7 – 20.8

EXERCISES – TEXT Ch 20: 41, 43, 45, 47, 49, 69, 71, 81

WKBK Lesson 30

### **KINETICS (4 Lectures)**

READINGS – KIN pp 1 – 50

EXERCISES – KIN Problems 1 – 9

WKBK Lesson 23

## **NUCLEAR TRANSFORMATIONS (3 Lectures)**

### **NATURAL RADIOACTIVITY**

READINGS – TEXT pp 1110 – 1118

EXERCISES – TEXT Ch 23: 12, 14, 18, 20, 22

WKBK pp 377 – 381

<b>Exam III Friday, April 25 2:25 – 3:15 p.m.</b>
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### **ENERGY IN NUCLEAR TRANSFORMATIONS**

READINGS – TEXT pp 1119 – 1121, sections 23.5 – 23.7

EXERCISES – TEXT Ch 23: 24, 26, 28, 46, 50, 58  
WKBK pp 381 – 388

### **USES OF NUCLEAR TRANSFORMATIONS**

READINGS – TEXT 23.4, 23.8 – 23.9

EXERCISES – TEXT Ch 23: 30, 36, 54, 56  
WKBK pp 389 – 392

### **POLYMERS (2 Lectures)**

READINGS – TEXT 11.5

EXERCISES – TEXT Ch 11: 53, 55, 79  
WKBK Lesson 36

<b>Summary (Final) Exam    Friday, May 16    12:25 – 2:25 p.m.</b>
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## Chemistry 104 – Lecture Section 4 – Spring 2008

### Lecture, Chemical of the Week, and Laboratory Schedule

DATE	LECTURE TOPIC	CoW	LABORATORY
Jan 23 (W)	Course Introduction	Ethanol & Lake Lore	No Lab
Jan 25 (F)	Carbon Chemistry		
Jan 28 (M)	Carbon Chemistry	Chemoreception	Check-in, Molecular Structures, Excel Exercise
Jan 30 (W)	Carbon Chemistry		
Feb 4 (M)	Carbon Chemistry	Acetic Acid and Acetic Anhydride	Preparation of Aspirin & Some Flavoring Esters
Feb 6 (W)	Carbon Chemistry		
Feb 11 (M)	Carbon Chemistry	Fats and Oils	No Lab
Feb 13 (W)	Carbon Chemistry		
Feb 18 (M)	Equilibrium Principles	Ammonia	No Lab
Feb 20 (W)	Equilibrium Principles		
Feb 22 (F)	<b>Exam I 2:25 -3:15 p.m.</b>		
Feb 25 (M)	Solution Equilibria	Phosphoric Acid	Chemical Equilibrium & Le Chatelier's Principle
Feb 27 (W)	Solution Equilibria		
Mar 3 (M)	Solution Equilibria	Carbon Dioxide	Equilibrium Exercises
Mar 5 (W)	Solution Equilibria		
Mar 10 (M)	Coordination Compounds	Chelates and Chlorophyll	Acid and Base Solutions
Mar 12 (W)	Coordination Compounds		
Mar 17 – 21	<b>Spring Break</b>		
Mar 24 (M)	Coordination Compounds	Colors of Gemstones	No Lab
Mar 26 (W)	Electrochemistry		
Mar 28 (F)	<b>Exam II 2:25 - 3:15 p.m.</b>		
Mar 31 (M)	Electrochemistry	Aluminum	Copper Ammine Complexes
Apr 2 (W)	Electrochemistry		
April 7 (M)	Electrochemistry	Chlorine and Sodium Hydroxide	Electrochemical Cells
April 9 (W)	Kinetics		
April 14 (M)	Kinetics	Ozone	Kinetics of the Reaction of Crystal Violet with NaOH
April 16 (W)	Kinetics		
April 21 (M)	Kinetics	Environmental Nuclear Radiation	No Lab
April 23 (W)	Nuclear Transformations		
April 25 (F)	<b>Exam III 2:25 -3:15 p.m.</b>		
April 28 (M)	Nuclear Transformations	Uranium: A Radioactive Clock	Neutron Activation of Silver/Checkout
April 30 (W)	Nuclear Transformations		
May 5 (M)	Polymers	Polymers	No Lab
May 7 (W)	Polymers		
May 16 (F)	<b>FINAL EXAM 12:25 – 2:25 p.m.</b>		

