



# CHEMISTRY 104

Lecture Section 2  
MWF 11:00 A.M. Room 1351 Chemistry  
[www.scifun.org](http://www.scifun.org)



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.)  
Office Hours: Mondays 1:30 - 3:00 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 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 2003, you should review the material in my Chemistry 103 syllabus as soon as possible to bring your level of competence up to the "acceptable" range. All such students should complete Lessons 5, 6, 7, 8, 9, 12–15 and 35 in the Workbook for General Chemistry 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.

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*, Kotz & Treichel., 5th edition, Thomson Publishing Co., 2003. (TEXT)
2. *Chemical Equilibrium*, Bassam Z. Shakhashiri and Rodney Schreiner, Stipes Publishing Co., 1993. (EQUIL)
3. *Chemical Kinetics*, Bassam Z. Shakhashiri and Rodney Schreiner, Stipes Publishing Co., 1992. (KIN)
4. *Workbook for General Chemistry*, Bassam Z. Shakhashiri and Rodney Schreiner, Stipes Publishing Co., 2000. (WKBK)
5. Chemistry 103/104 Laboratory Manual, Fall 2003 or Chemistry 104 Laboratory Manual, Fall 2003, 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. 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. In addition, a set of lecture notes will be available in the General Chemistry Study Room, Room 1371, and these may be duplicated on the photocopy machine nearby. After lecture you should review your notes and study the appropriate readings and work the suggested exercises. See page 8 for Helpful Study Hints. (The answers to many of the exercises are provided in the book.) In addition, I will suggest exercises in lecture.

The **Friday lectures** are designated for reinforcement and enrichment. The reinforcement lectures will be given by Dr. Linda Zelewski who will review material from the Monday and Wednesday lectures to further

help each student grasp important concepts and principles and to provide more drill in solving problems. The enrichment lectures will be given by prominent outside speakers who will further illuminate your knowledge of science and can also inspire career options.

**DISCUSSION 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. 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

721	12:05 TR	2381 Chem	7:45-10:45 W	1335	Thomas/Loe	721
722	1:20 TR	2381 Chem	7:45-10:45 F	1335	Thomas/Loe	722
723	3:30 TR	B355	7:45-10:45 W	1335	Yi/Yi	723
724	4:35 TR	B355	7:45-10:45 F	1335	Yi/Yi	724
725	11:00 TR	2377 Chem	7:45-10:45 T	1335	Gehrmann/Liptak	725
726	12:05 TR	138 Witte Hall	7:45-10:45 R	1335	Gehrmann/Liptak	726
727	2:25 TR	B387	7:45-10:45 T	1335	Hall/Hall	727
728	3:30 TR	10 Ogg Hall	7:45-10:45 R	1335	Hall/Hall	728
729	7:45 TR	2307 Chem	11:00-2:00 T	1335	Erwin/Erwin	729
730	8:50 TR	2307 Chem	11:00-2:00 R	1335	Erwin/Erwin	730
731	8:50 TR	2381 Chem	11:00-2:00 T	1335	Gehrmann/Liptak	731
732	9:55 TR	2381 Chem	11:00-2:00 R	1335	Gehrmann/Lennon	732
733	11:00 TR	B355 Chem	2:25-5:25 M	1335	Painter/Painter	733
734	12:05 TR	49 Sellery Hall	2:25-5:25 W	1335	Painter/Painter	734
735	3:30 TR	2307 Chem	2:25-5:25 M	1335	Thomas/Loe	735
736	4:35 TR	2307 Chem	2:25-5:25 W	1335	Thomas/Lennon	736

### E-Mail Addresses for TAs:

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Lynn Gehrmann	lpwirkus@facstaff.wisc.edu
Jocelyn Loe	loe@chem.wisc.edu
Rob Lennon	rplennon@chem.wisc.edu
Phillip Thomas	psthomas2@wisc.edu

**Quizzes.** There will be twelve take-home quizzes. They will be distributed every week, except exam weeks, at Wednesday lectures and collected at the start of the following Wednesday's lecture. The dates on which they are distributed are labeled with "Q" on the Course Schedule at the end of this syllabus. They will not be accepted late, but may be submitted early. You may discuss the quiz with other students. You may elicit help from your instructors, although none of us will directly answer the quiz questions. However, the work you submit on the quiz must be your own. Everyone must adhere to the honor code we use in this course.

## **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 below). 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, CHEM TIPS (see page 6) will enable you to discover in a timely manner those segments of the course that require more study on your part. Also, information from CHEM TIPS will help me and your Teaching Assistant in planning lecture and discussion sessions. Another learning aid you should take advantage of are 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.

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:

<u>Percent</u>	<u>Accomplishment Level</u>	<u>Letter Grade</u>
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	33 percent
quizzes	18 percent
laboratory	16 percent
final examination	33 percent

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

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.

**EXAMINATIONS.** All examinations will be worth 100 points each. There will be three exams of approximately 50 minutes each and a two-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. **Make-up exams will not be given.**

## 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.* Group membership is to be established and identified by January 30<sup>th</sup>; 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.**

**LEARNING COMMUNITIES.** Several sections in this lecture have been set aside for specific residence hall students. Section 426/726 is Witte Hall; Section 428/728, Ogg Hall; Section 431/731, Chadbourne; and Section 434/734, Sellery Hall. The Witte, Ogg and Sellery Hall discussion sections will be meeting in their respective residence halls. The Chadbourne section meets in the Chemistry Building, as do **all** sections of lab.

**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., fact sheets about one or two key chemicals will be distributed on a weekly basis during Monday's lecture. Also, they may be found 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.

**CHEM TIPS.** *Chemistry Teaching Information Processing System.* The objective of CHEM TIPS is to provide information about course progress to both students and instructors. In CHEM TIPS, you are given weekly surveys composed of a set of multiple choice questions. The surveys deal primarily with the subject matter of the preceding two lectures. Within hours (usually 4) after the survey is completed, an instructional

message based on your responses to the survey questions will be sent to you through electronic mail. This message identifies the correct answers to the survey questions, suggests materials for further study of areas in which your answers were incorrect, and provides additional information to help you master the course material. Your T.A. and professor will receive summary reports to let them know how the class is doing and to help them identify topics that may be causing trouble.

The surveys will be given during the last 10 minutes of **Monday** lectures. The responses to CHEM TIPS surveys will be scanned optically and processed by computer. Therefore, **please bring a #2 pencil with you on Mondays to mark the optical scanner sheet.**

Participation in the CHEM TIPS program is optional. The results are *not* used in preparing course grades. In the past, nearly all students participated in CHEM TIPS, and student reactions and evaluations were highly favorable. It is very important for you to stay up-to-date in your studies, and CHEM TIPS will help you do this in Chemistry 104.

TIPS was developed by Professor Allen C. Kelley, Department of Economics, Duke University. CHEM TIPS was adapted and implemented beginning in 1973 by Professor Bassam Z. Shakhshiri, Department of Chemistry, University of Wisconsin-Madison.

**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, if 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 page 1 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 p.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 905 University Avenue, Room 401, Monday, Tuesday, Thursday and Friday, 8:30 a.m. - 5:00 p.m., and Wednesday, 9:00 a.m. 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.

## **CHEMISTRY LEARNING CENTER**

The Chemistry Learning Center is for students who wish to improve their ability to learn chemistry. Participation is voluntary and there is no fee. Students meet in small groups with staff to work out effective strategies for mastering the chemical content. The Chemistry Learning Center is located in Room B311 of the Chemistry Building. Fall hours are from 9:00 a.m. to 5:00 p.m, Monday through Friday. Contact Scott Mellon at 265-5497 ([srmellon@wisc.edu](mailto:srmellon@wisc.edu)).

## **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. <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.

## **NATIONAL SCIENCE AND TECHNOLOGY WEEK**

One week of March has been proclaimed as National Science and Technology Week for 2004. Be on the lookout for a variety of items and activities which will be brought to your attention by me and by your TA. Also, check the University Bookstore calendar for the dates and locations of the SCIENCE IS FUN activity during the academic year.

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

All eligible voters should exercise their right to vote in this Spring's elections. The Wisconsin Primary will be held on Tuesday, February 17, and the General Election will be held on Tuesday, April 6. Our democracy can be effective if all citizens participate responsibly.

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 country clerk's office at 266-4121. Information is also available on the web at <http://www.ci.madison.wi.us.Clerk/election.html> 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

**Note: An exam may occur in the middle of a unit.**

### **CARBON CHEMISTRY (5 Lectures)**

#### **MOLECULAR STRUCTURES AND ISOMERS**

READINGS – TEXT 11.1

EXERCISES – TEXT Ch 11: 4, 6, 76 (w/o names)  
WKBK pp 378 – 387, 433 – 441

#### **HYDROCARBONS**

READINGS – TEXT 11.2, Appendix E.1

EXERCISES – TEXT Ch 11: 18, 20, 22, 24, 26, 30, 32, 34, 36, 38, 40, 42, 86, 92  
WKBK pp 388 – 403, 415 – 417

#### **ALCOHOLS, ETHERS, & AMINES**

READINGS – TEXT 11.3, Appendix E.2

EXERCISES – TEXT Ch 11: 8, 46, 48, 50, 52  
WKBK pp 404 – 414, 418 – 419

## **CARBONYL COMPOUNDS**

READINGS – TEXT 11.4

EXERCISES – TEXT Ch 11: 10, 54, 56, 58, 60, 62, 66, 88, 90,  
WKBK pp 420 – 429

## **PROPERTIES OF SOLUTIONS (2 Lectures)**

### **COLLIGATIVE PROPERTIES**

READINGS – TEXT 14.4

EXERCISES – TEXT Ch 14: 44, 46, 50, 52, 54, 58, 62, 64  
WKBK pp 179 – 186

### **OSMOSIS AND COLLOIDS**

READINGS – TEXT 14.4 – 14.5

EXERCISES – TEXT Ch 14: 68, 70  
WKBK pp 187 – 190

<b>Exam 1 — Friday, February 13<sup>th</sup> — 11:00–11:50 a.m.</b>
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## **EQUILIBRIUM PRINCIPLES (2 Lectures)**

READINGS – EQUIL pp 1 – 29

EXERCISES – EQUIL 1.1 – 1.3, 2.1 – 2.4, 3.1 – 3.2  
WKBK Lesson 17

## **SOLUTION EQUILIBRIA (4 Lectures)**

READINGS – EQUIL pp 30 – 43, 43 – 85

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 – 22.4

EXERCISES – TEXT Ch 23: 22, 24, 26, 28, 30, 32, 34, 36, 54, 66  
WKBK Lesson 24, 25, 26

**Exam 2 — Friday, March 12 — 11:00–11:50 a.m.**

**ELECTROCHEMISTRY (3 Lectures)**

**ELECTROCHEMICAL CELLS**

READINGS – TEXT 20.2 – 20.4

EXERCISES – TEXT Ch 20: 7, 18, 20, 24, 28, 30, 32, 34, 66, 68  
WKBK pp 334 – 343

**CONCENTRATION EFFECTS & BATTERIES**

READINGS – TEXT 20.5 – 20.6

EXERCISES – TEXT Ch 20: 4, 22, 36, 38, 40, 42, 44 88  
WKBK pp 344 – 349

**ELECTROLYTIC CELLS**

READINGS – TEXT 20.7 – 20.10

EXERCISES – TEXT Ch 20: 52, 54, 60, 70, 80  
WKBK Lesson 29

**KINETICS (3 Lectures)**

READINGS – KIN pp 1 – 50

EXERCISES – KIN Problems 1 – 9  
WKBK Lesson 23

**Exam 3 — Friday, April 16<sup>th</sup> — 11:00–11:50 a.m.**

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

### **NATURAL RADIOACTIVITY**

- READINGS – TEXT pp 963 – 970  
EXERCISES – TEXT Ch 23: 12, 14, 18, 20, 22  
WKBK pp 362 – 366

### **ENERGY IN NUCLEAR TRANSFORMATIONS**

- READINGS – TEXT pp 971 – 973, 23.5 – 23.7  
EXERCISES – TEXT Ch 23: 24, 26, 28, 46, 50, 58  
WKBK pp 366 – 373

### **USES OF NUCLEAR TRANSFORMATIONS**

- READINGS –  
TEXT 23.4, 23.8 – 23.9  
EXERCISES – TEXT Ch 23: 30, 36, 54, 56  
WKBK pp 374 – 377

**Final Exam — Thursday, May 13 — 12:25 – 2:25 p.m.**

## Lecture and Laboratory Schedule – Spring 2004

### Chemistry 104 Lecture Section 2

DATE		LECTURE TOPIC	WEEKLY LABORATORY EXPERIMENT
Jan 21 (W)	Q	Course Introduction	NO LAB
Jan 23 (F)		Reinforcement & Enrichment	
Jan 26 (M)		Carbon Chemistry	Check-in, Molecular Structures, Excel Exercise
Jan 28 (W)	Q	Carbon Chemistry	
Jan 30 (F)		Reinforcement & Enrichment	
Feb 2 (M)		Carbon Chemistry	Preparation of Aspirin & Some Flavoring Esters
Feb 4 (W)	Q	Carbon Chemistry	
Feb 6 (F)		Reinforcement & Enrichment	
Feb 9 (M)		Colligative Properties	No Lab
Feb 11 (W)		Osmosis and Colloids	
Feb 13 (F)		<b>Exam I 11:00 a.m.</b>	
Feb 16 (M)		Equilibrium Principles	Chemical Equilibrium & Le Chatelier's Principle
Feb 18 (W)	Q	Equilibrium Principles	
Feb 20 (F)		Reinforcement & Enrichment	
Feb 23 (M)		Solution Equilibria	Equilibrium Exercises
Feb 25 (W)	Q	Solution Equilibria	
Feb 27 (F)		Reinforcement & Enrichment	
Mar 1 (M)		Solution Equilibria	Acid and Base Solutions
Mar 3 (W)	Q	Solution Equilibria	
Mar 5 (F)		Reinforcement & Enrichment	
Mar 8 (M)		Coordination Compounds	No Lab
Mar 10 (W)		Coordination Compounds	
Mar 12 (F)		<b>Exam II 11:00 a.m.</b>	
Mar 22 (M)		Coordination Compounds	Titration (Expt 22)
Mar 24 (W)	Q	Electrochemistry	
Mar 26 (F)		Reinforcement & Enrichment	
Mar 29 (M)		Electrochemistry	Copper Ammine Complexes
Mar 31 (W)	Q	Special Lecture	
Apr 2 (F)		Reinforcement & Enrichment	
April 5 (M)		Electrochemistry	Electrochemical Cells
April 7 (W)	Q	Kinetics	

<b>DATE</b>	<b>LECTURE TOPIC</b>	<b>WEEKLY LABORATORY EXPERIMENT</b>
April 9 (F)	Reinforcement & Enrichment	
April 12 (M)	Kinetics	No Lab
April 14 (W)	Kinetics	
April 16 (F)	<b>Exam III 11:00 a.m.</b>	
April 19 (M)	Kinetics	Kinetics of the Reaction of Crystal Violet with Sodium Hydroxide
April 21 (W)	Q Nuclear Transformations	
April 23 (F)	Reinforcement & Enrichment	
April 26(M)	Nuclear Transformation	Neutron Activation of Silver/Check-out
April 28 (W)	Q Nuclear Transformation	
April 30 (F)	Reinforcement & Enrichment	
May 3 (M)	Polymers	
May 5 (W)	Q Polymers	No Lab
May 7 (F)	No Lecture	
May 13 (Thur)	<b>FINAL EXAM</b>	<b>12:25 - 2:25 p.m.</b>



