THIS FILE IS RE-REVISED and FINALIZED TO COVER THE ENTIRE SEMESTER

CHEMISTRY 2301-2

Organic Chemistry I – 3 credits

Fall Semester 1999
325 Science Classroom Building
web site: http://www.chem.umn.edu/class/2301/barany/2301.html

The following problems from Wade, 4th edition, should be representative of the level of difficulty and comprehension that you are expected to know for examinations. You will be allowed to use simple electronic calculators (not the programmable type) and molecular models. To a first approximation, Exam #1 is based on Chapters 1 and 2, and Exam #2 is based on Chapters 3, 5, and 6, with a smattering of Chapter 4. Exam #3 focuses on structure determination -- the skills of Chapters 12 and 13, with additional aspects put in as class coverage warrants. Exam #4 covers the remaining agenda for the first semester, i.e., a focus on Chapters 7-11; this includes simple synthesis (small number of steps) and mechanism questions (identify reactive intermediates, "push" electrons to explain reaction pathway). The Final Exam will be cumulative, emphasizing material from throughout the course (no new material will be taught after Exam #4). As I explained in the Syllabus, on the Wednesday preceding a Monday exam, you will get a Practice Exam, and part of the next class meeting on Friday will be to review this exam. It is not practical to have either a recitation/review session or a Practice Final Exam, for reasons that have been explained elsewhere.

It may be informative for you to read on Wade page 35 the author's perspective on problem sets. He says "Taking organic chemistry without working the problems is like skydiving without a parachute. Initially there is a breezy sense of freedom and daring. But then, there is the inevitable jolt that comes at the end for those who went unprepared." To which I can only add that for those of who believe that "if you don't succeed at first, try try again," skydiving should not be your hobby!

In general, the book is really well organized with respect to the end-of-chapter summaries, glossaries, essential problem-solving skills, etc. They will be a good way for you to get going on your own studying.

You should also try some of the quizzes and exams corresponding to each Chapter on the Wade web site. However, please keep in mind that I do not offer multiple-choice questions.

Some final thoughts. Remember the analogy that I gave early during the course about the person stuck in a 21-foot deep well, who scratches and claws up 3 feet every day, and slips 2 feet down every night. How many days does it take to get out of the well? Some of you might feel just a bit overwhelmed at the sheer quantity of material here, but you should be reassured that by now we have developed the basic concepts and principles, and are starting to apply them. Almost everything we learn you see at least twice (coming and going), and each additional time, it makes more sense. Do not succumb to the temptation to cram or to memorize, it will make things worse. Work the problems steadily, and bring your concerns and questions to the TAs during their tutor hours, post them on the class bulletin board, or discuss them with me during my office hours. Everyone is committed to helping you succeed in this course, consistent with your commitment and your individual learning style.

Chapter 1:

In text:

1-17 (none of them are that hard, and they should go quickly. If you're confident that you are understanding the material, pick and choose among the multi-part ones, for example, do the first few, then try two or three near the end).

Study problems:

20, 21, 22, 24, 25, 26, 27, 28, 30a,b,c, 32, 33, 35, 36, 38 (somewhat harder), 39 (pick a few), 40, 43, 45

Chapter 2:

In text:

1-7, 10, 15, 16, 17, 20, 21 (by the way, you'll have enough on your hands to learn regular bonding, so I won't make you worry about anti-bonding. Also, as long as you understand the basic principles of dipole moments, there is no need to get into it quantitatively. Everything else in the Chapter is very fundamental stuff that you just have to know thoroughly, almost instinctively)

Study problems:

22 (just about all of them), 25, 26, 27, 29a,c,d, 32, 33 (pick a few), 36, 38 (pick a few), 39, 40

Chapter 3:

In text:

2-7, 11, 13, 14, 16, 18, 19, 21, 22, 24, 26, 28 (note that section 3-4, 3-5, and 3-6 can be glossed over; as far as nomenclature is concerned, my philosophy is that you don't have to memorize the rules but you should be able to solve problems with the rules in front of you)

Study problems:

32 (don't overdo it, but you should know most of those), 33, 34, 37 (do at least half of them), 40, 44, 45, 46

Regarding **Chapter 4**, we will come back to it later, perhaps on a "need-to-know" basis with respect to other material that we will learn from subsequent chapters. Skim through it at your convenience, and focus on anything that you recognize: e.g., kinetics, thermodynamics, mechanism; structures of reactive intermediates.

Chapter 5:

In text:

1-6, 11, 12, 14, 16, 18-21, 25 (almost everything in Chapter is very fundamental, but I don't get into some of the gory details of measuring optical rotation, or some of the really subtle stereochemistry issues where asymmetry occurs without chiral carbons; as always, pick and choose for multi-part questions depending on how well you think you understand the material being tested)

Study problems:

26-32, 34, 36

Chapter 6:

In text:

1-3, 5, 8-16 (for some of section 6-6, we will need to go back to Chapter 4), 21-25, 27, 28, 30-32, 37, 42, 44-46, 48

Study problems:

49, 52-55, 59, 61, 64, 65, 72-75.

Chapter 4:

In text:

1, 2, 4, 5, 8-10 (these three are optional), 11-13, 16, 21, 28

Study problems:

32-34, 39, 41, 43, 48,52

Reminder: Trust us to design fair exam questions based on this material. Calculations of delta G, H, S can be done "open book". A complete rundown of what you absolutely need to know from this chapter will be found in the Class Diary ... sections as yet to be distributed to the class.

Chapter 12:

In text:

1, 4-6 (all these problems can be "open book"), 7-11

Study problems:

12, 15, 16, 18, 19, 20, 25

Chapter 13:

In text:

2, 3, 5, 6, 8, 10, 13, 14, 21, 24, 26, 30

Study problems:

34, 35, 38, 40, 42, 47

Chapter 7:

In text:

1-4, 6, 8, 10-17

Study problems:

19-22, 25-37, 40-43

Chapter 8:

In text:

1-5, 10-12, 15-20, 22-28,33, 35, 36, 42

Study problems:

43 (do most of them), 44 and 45 (do as many as you can until you are confident that you understand), 46, 47, 52, 53, 57, 58, 61, 63, 64, 65, 67

Chapter 9:

In text:

1-7, 9-13, 16-23

Study problems:

26, 28, 30, 31, 32, 34 (do at least half), 36, 38, 40, 41

Chapter 10:

In text:

1, 4, 5, 12-26

Study problems:

30, 31, 32, 37, 38, 39, 41, 44

You can try some of the other study problems too. Remember, the more you do, the more secure your understanding will be.

Chapter 11:

In text:

1, 3, 4, 6, 11, 12, 15, 18-20, 23, 25, 36

Study problems:

38, 39, 40, 43, 46-52