Organic Chemistry
Study Guide

What I hope to give you in this study guide are my personal ideas regarding the best, most effective, way to study organic chemistry - to be honest, I am speaking from personal experience - these are the techniques that I used when I was an undergraduate. Your goal is to manage and learn the vast amount of material that is presented to you in this class. I will present quick explanations, but feel free to email me with any specific questions that you have. And remember these techniques do not guarantee success - ultimately you have to find the method that works best for you.

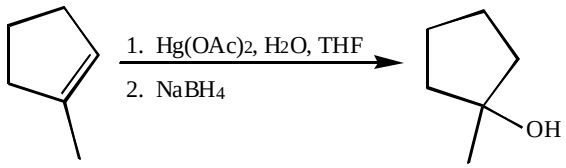
Let's start with the Don'ts:

Don't wait too long before you start seriously studying the material. Remember that time is not on your side - you have many classes and they all require a time commitment, but this can be managed if you do a little bit of organic studying everyday. It is never too early to start reading the book or reading through the notes, but with about a week left before the exam you need to begin a new kind of studying (more on this later).

Don't rely on tutors or group-study to learn the material - this is often not very effective. Tutors and group-study work best when used to clarify confusing points or help confirm that you already know the material by providing additional questions/problems.

OK, now the Do's:

Do start the 'serious studying' at least one (1) week before the exam. What is 'serious studying?' Good question. What I mean by this is that the best way to learn the material is by writing it, not reading it. Reading is good for the initial exposure to the material, but to really learn it you have to write it. And don't be fooled - many of you use flash cards - the first time you write the reaction scheme on a flash card you are performing the same operation that will be required of you on an exam (and that's great), but after that, when you 'study' the cards, all you are really doing is reading them. I believe that the best exercise you can do is take your lecture notes and a separate notebook and begin transferring reaction schemes from the notes to notebook. Along with the reaction schemes you should include any relevant regio- and stereoselectivity associated with the reaction. Start at the beginning and work through the notes - one reaction at a time. **Do this by yourself, with as little distraction as possible**. Here is an example:



Regiosel. - Markovnikov addition of OH
Stereosel. - The H and OH add anti to each other across the dbl. bond

Remember you have a whole week so you don't need to do all the reactions in one day. Let's say you can get through ten (10) reactions in one day. The next day re-write those ten and do ten more, including regio- and stereoselectivity information. The next day re-write the first twenty (20) and continue with an additional ten, etc. Keep doing this - even if you think you know the reactions - keep repeating this exercise. Make it more difficult by changing the direction of the reaction (start with the product and predict what starting material or reaction conditions should be used). Remember I present the reaction from left to right, but the exam will often test your knowledge from right to left. For example, start with the above alcohol and try to determine the

starting material and reaction conditions necessary to make it. This will be a particularly useful skill when you attempt a synthesis problem. And don't forget to do as many of the relevant in the book questions (i.e. topics we covered in lecture). These are useful in-group study (see below).

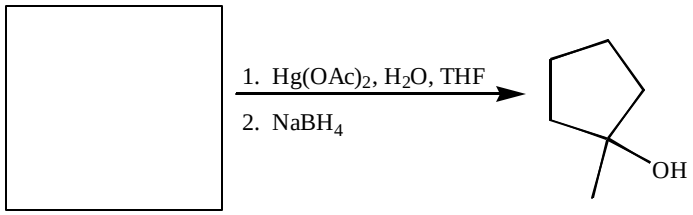
Do repeat the above exercise over and over and over. The best way to learn most anything is through repetition. This is why you need to start as early as possible and do a few reactions everyday.

Do learn the mechanisms in the same way - write them over and over. When you have questions regarding a mechanism concept (i.e. why does the nucleophile attack a particular atom?, etc) you should see a tutor or email me.

What happens when you have the exam in front of you?

Many of you experience the dreaded 'test anxiety' when you first see the exam (or maybe when you wake-up the day of the exam). This is very natural, and it stems from uncertainty - you are uncertain what questions are on the exam and you are uncertain with your preparation for the exam. I have a few things to say about this (and you should look back at exams 1 & 2 to confirm): absolutely nothing new is presented on the exam - it is all material that has already been presented to you in class. Moreover, the questions are not 'trick' questions. It is true that you must read the directions, but nothing on the exam is meant to trick you. Here are a few exercises to try:

- A few days before the exam try getting a small group together (3-5 people) and practice the book problems or prepare some original problems (this is very helpful) and present them to the group. I suggest that you put a time limit to solving the problems (5 mins. or less). This will do two things it will get you use to solving problems with some time pressure and it will build-up your confidence. The more problems you can successfully solve the more confident you will become. If you are unable to solve the problem have the group give you small (the smaller the better) hints until you can figure it out.
- Get a good night's sleep before the exam! If you think you can study all-night and then 'ace' the exam - forget it! There is simply too much material for this method of studying. Start studying early - and get some sleep. If you have prepared effectively, you really only need to review the notes on exam day.
- As soon as you have the exam in front of you look over the entire thing - every page. First, do the problems that you definitely know (these will be the easiest problems for you and you maximize your potential points if you do run out of time). Keep going through the exam, solving the more difficult problems. You will find that your brain will get 'warmed-up' and you will have an easier (even pleasant) time.
- Something else to try when you are working on the exam problems is look for the key piece of information that will help you solve the problem. For example, if you are presented with the following problem:



First, look at the general structure of the product - it will give you a lot of information regarding the starting material (i.e. the starting material may be a cyclopentyl ring, etc). However, the reaction conditions are the key, since they fix the reaction - in this case the Markovnikov addition of H_2O across a double bond - an oxymercuration reaction. Specifically, it should have been the $Hg(OAc)_2$ that was the big clue. Look for these clues - this is why you must write the regio- and stereoselectivity information along with the reaction scheme when you are studying.