



SUCCESS IN ORGANIC CHEMISTRY (CH 107, 235, 237)

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CONFIDENCE

- “Confidence comes only from practice in solving other problems and finding that you can. No one learned to play a musical instrument by reading a book or attending a lecture on how to play a musical instrument. The learning involves practice and hard work.”

--Richard Zare *C&ENews*, 3/22/10

- Please note that “other problems” in our context might mean solving problems that aren’t exactly like those that will be on an exam.

ORGANIC IS DIFFERENT

- Organic Chemistry is unlike any other subject you have studied so far. To enjoy it and succeed in it not only will you have to work hard, but you will also have to develop special study habits. Learning organic chemistry is like learning a new language. It can only be done gradually.

ORGANIC IS DIFFERENT

- Organic chemistry has a relatively *few* simple concepts involved in *many* different reactions. These concepts include:
 - valence electron orbitals,
 - resonance, and
 - electrophilic and nucleophilic properties, etc.
- Make connections between these properties to understand how molecules will react and why. By understanding the mechanism behind each reaction, you will be successful!

STUDY TIPS

- Come to lecture and discussion sections *prepared*, and try to **understand** the logic behind the material. Understanding this logic is the first step to success.
- Ask questions. Participate in class.
- Make use of office hours. Make sure that all the important issues are clear to you. Remember that **help is available**.

STUDY TIPS

- **Read** your textbook before class.
- Make your own notes as you read.
- Highlight reactions and mechanisms.
- Make sure that you follow the logic behind them and that you understand why things happen the way they do.
- Compare the book and your own notes (from reading) with your lecture notes *as soon after class as possible*.
- Consider recording the lecture if permitted.
- Don't take notes on a laptop, or get distracted.

STUDY TIPS

- Study the subject until it **sinks in**. Be able to write the reactions and the mechanisms *without* checking the book or notes.
- Write the reactions and mechanisms on a piece of paper **repeatedly** until you know them by heart. Remember that you are learning a new language, and the reactions are the new "words." If you don't know them, you won't be able to use them or recognize them on the exam.

STUDY TIPS

- **Make your own summary sheets.** Nobody learns organic chemistry by just looking at flash cards or a computer screen.
- The only way to learn organic chemistry is by **writing** and **rewriting** the reactions and mechanisms until they stick.
- List **all** the reactions and their mechanisms summarized on a large piece of paper. The book has good summaries at the end of the chapters; use them to make your own.
- Connect new concepts with previous ones.

STUDY TIPS

- **Do not fall behind.**
- Set times during the day to study chemistry, and stick to your schedule. Discipline is the key ingredient for success.
- The newly learned concepts will sink in only if you give them enough time to settle. **Do not** wait until the night or week before the test to catch up with several days or weeks of studying/homework. It will not work.

CHANGE STUDYING?

- If you're not comprehending, or if you had a less than desirable exam grade, you need to CHANGE something. Avoid insanity (doing the same thing expecting a different result).
- Relatively easy things to change:
 - When are you studying? Are you studying when you are tired or distracted? Identify another time during the day that might be better for you.
 - Where are you studying? Is the environment conducive to studying? Are there too many distractions (TV, internet, roommates, family....)

CHANGE STUDYING?

- A little more difficult to change:
 - What are you studying? Notes? Text? Online tutorials? Homework problems? Evaluate which ones work best for you.
 - Are you maintaining a regular study schedule? Keeping up with the material and balancing classes/work/life can be difficult. Cramming doesn't work!

STUDY GROUPS

- Are you working with peers who enhance your learning? Sometimes you may be working lots of the problems; sometimes you may need the most help.
- Do your peers hold you responsible for learning and check to see that you really understand (as opposed to agreeing on answers)? Challenge each other respectfully. Well-functioning groups improve grades. Poorly functioning groups can hurt grades.

CHANGE STUDYING?

- Are you studying the best way for you?
Reading in chemistry doesn't really lead to As. Working problems is more effective, but not just to get to answers. Work the problem; review; take notes.
 - What concepts were used in the problem?
 - What topics were used that weren't explicit in the problem?
 - What relationships were required?
 - Would online tips or videos help me learn this?

RE-THINKING STUDYING CH

- PASSIVE LEARNING IS only a small part!
 - Reading and using note cards
 - Listening to people explain things
 - Seeing others work problems
- ACTIVE LEARNING IS KEY
 - Summarizing without the book or notes
 - Thinking critically about your work
 - Why? What does it mean? How would I teach someone this?

PROBLEM-SOLVING in CH

- DON'T work problems just to get an answer.
- DO work problems (incl. samples) TO LEARN.
- How many should you work (beyond what the professor assigns and recommends)?
 - How well do you want to learn the concepts?
 - How prepared do you want to be for the timed test?

PROBLEM-SOLVING in CH

- Avoid shortcuts until you are certain:
 - Why?
 - When?
 - How?
 - Remember to...
 - Always...
 - Never...
 - Watch for...

PROBLEM-SOLVING to LEARN

- Which ones are difficult?
- How will I remember how to work them?
- Use subheadings or notes in margins, like:
 - NAME GRPS. IN ALPHA. ORDER.
 - LONGEST CHAIN IS 7
 - TERTIARY ALCOHOLS DO NOT REACT
- Highlight key steps and make notes, especially after you make a mistake.

PROBLEM-SOLVING in CH

- Work problems on your own with NO notes, text, solution guide, etc.
- Write an explanation for each step, as if YOU are writing a study guide. Say it out loud as if you are creating a tutorial for someone who was absent.
- Note everything you have to decide, and how you know what to do.

STUDY PLANS

- Plan time to study:
 - Know test and assignment due dates (all).
 - Plan for known schedule issues (family, etc.).
 - Build in buffers (planned happenstance).

EXAM PREP. (CRITICAL)

- Read ahead and work sample problems.
- Outline the material as you go.
- Identify memory vs. concept topics
 - Primary vs. secondary vs. tertiary R-OH
 - Why R-OH boils at higher temp than nonpolar
- Pay attention to relationships.
- Work as many problems as possible over time, not just once!

EXAM PREP. (CRITICAL)

- Plan study time according to mastery.
 - Spend less time on known topics.
 - Spend more time on mystery topics.
 - Start early determining which is which!
- Plan how to spend time with experts.
 - UASC tutor or private pay tutor
 - Study group (yes, even this)
 - SI leader
 - Instructor

EXAM PREP. (CRITICAL)

- For mystery topics:
 - Look for notes and text coverage of these.
 - Check other books or online resources.
 - Look for similar words / meanings.
 - Adjust notes if needed (in group, perhaps).
 - Learn from this how to take notes better.
 - Hint: review and edit notes immediately after class and as you work problems.
 - Get help from others (mentioned above), but come prepared.

EXAM PREP. (CRITICAL)

- Study textbook by topic, not by chapter.
- Example: ether... Ask yourself:
 - What is it? (Good use of flash card here.)
 - What are some common examples? (fl. cds.)
 - How does it differ from similar compounds?
 - How are ethers named?
 - What are their properties, and WHY?
 - How do they react, and WHY?

ASKING FOR HELP

- I can't get #40. Can you tell me the answer?

Vs.

- Problem 40 is about thiol oxidation, and I have written the formula and checked the book, but I can't figure out how to balance the formula in the book. Does the oxidation cause hydrogen gas to be released as H_2 , and would H_2 be needed for the reduction reaction?

ASKING FOR HELP

- How do organohalogens react, and why?

Vs.

- I would have expected organohalogens to be polar because of the very electronegative halogens like Cl or Br. Can you explain why they are nonpolar?

ASKING FOR HELP

- What did we cover in class last week? I was absent.

Vs.

- In class last week, I know that we covered polar molecules. I have read the chapter and worked through all of the homework, but can you explain again why the water molecule is polar and CO₂ is not? My study group didn't understand that.

TEST-TAKING

- Glance over the exam first. Don't panic.
- (See counseling center ASAP if you have test anxiety.)
- Read through the questions and plan how to spend your time to answer as many questions as correctly as possible.
- Don't second-guess on fact questions.
- Write down the answer to each step of the problem.

ATTITUDE

- Accept responsibility for your success.
- Avoid negative attitudes.
- Assume the best about the instructor.
- Decide to succeed and do your best.
- Give your brain/body what they need:
 - Sleep
 - Exercise
 - Diet
 - Stress management