
Study Guide for Final Exam

For the Final Exam you will need:

- a non-programmable, non-graphing calculator (You will NOT be allowed to share or borrow a calculator or use a cell phone for a calculator during the exam.)
- a #2 pencil
- Your EMPL ID #.

Final Exam Protocol:

- I will provide the scantron just like for your diagnostic quiz, but you need your EMPL ID this time.
- I will also provide a periodic table (same one you have been given all quarter) and the equation sheet (see what is given online). I will also provide all the scratch paper you could ever need.
- You will have 2 hours (to a max of 2 hours, 15 minutes) to complete the exam. That should be plenty of time for most of you.
- The exam is 50 multiple-choice questions.
- Read each question and the directions carefully. The directions may change from problem to problem or refer to a previous figure.
- If you don't know how to do a problem, skip it and move on. Careful of the time. Some of the multiple-choice questions could take a while, but some of them are quick. Try to do the problems that you know how to do first.
- When you complete the exam, you need to turn in the complete exam, scantron, the periodic table/equation sheet, and the scratch paper. Unfortunately, if you don't turn all of this in, you will receive a zero on the final. Don't leave unless I say you turned everything in, I don't want anyone getting a zero!

The final exam covers the material that we discussed from chapters 6, 7, 8, 9, 10, 11, 17, and 20 in lecture and in the text. Key items from the first five chapters (metric conversion, how to calculate molar mass, etc.) may also be included in the context of other problems. Reviewing all the previous 5 chapters is not necessary. Just review the ideas from those chapters that we have used during Chem 124.

My advice for the exam is to **FIX YOUR PREVIOUS MISTAKES!** Study your old quizzes and exams and correct any mistakes you have made. Look at your worksheets and lecture notes. All of the final exam material is in there. We have talked about everything on the final exam and you have been quizzed or tested on almost all of it at some point during the quarter. If you truly understand the material, then the "new" question on a topic during the final exam should be easy. I have been challenging you all quarter so that the final will not be a shock in terms of difficulty. It should feel just like any other exam (maybe easier since it is all multiple-choice and you can answer every question.)

Look to the other three exam study guides for guidance on what may be on the final.

Here is what could be on the final from where we left off after exam 3:

- Valence-Shell Electron-Pair Repulsion Theory (VSEPR): know the electron-group arrangements, the molecular geometries for all those on the table on the handout from class
- What is molecular polarity? How do you determine it? What is a dipole moment? Can you decide if a molecule is polar or nonpolar?
- Bond energy – what is it? Can you use it to calculate the heat of a reaction?
- Organic chemistry nomenclature: You should know how to name and recognize alkanes, alkenes, alkynes, alcohols, ketones, and aldehydes (know all the prefixes for 1-10). Know the numbering preference and what to do if the functional group is not in the longest carbon chain or if there are groups hanging off the main backbone.
- Know the four different isomers: skeletal, functional, positional, and geometric. Can you recognize an isomer or a molecule just drawn a different way?
- Infrared spectrum – know the key functional groups we talked about, where they are, and their genuine shape. The features include the –OH group (broad feature around 3300 cm^{-1}), $-\text{CH}_2-\text{CH}_3$ (sharp feature around $2900\text{-}3000\text{ cm}^{-1}$), and C=O (sharp feature around 1700 cm^{-1}).
- Know how a GC works, what is retention time, what dictates how the molecules are separated (boiling point and polarity). Could you predict the order the molecules would come off the column looking at the table from the 7-component mixture?

Here are some things we have covered, but **WILL NOT** be on the final exam:

- Calculations involving the photoelectric effect. The CONCEPT may be on your exam, but no calculations.)
- Two of the three ways to move electrons across the band gap. The electrical energy calculation ($2\text{ eV} = 10^6\text{ V/cm}$) and thermal energy calculation ($E = T \times 0.86 \times 10^{-4}\text{ eV}$) won't be on there. (Using light CAN be on the final, and you should know all those equations already for transitions in a hydrogen atom.)

The main thing is to keep practicing problems, work on the problems and worksheets, review quizzes and exams. Don't just look at the solutions for the worksheets, really review. You have good practice there. If you need help, please come see me or attend one of the review sessions.

Help:

- E-mail
- Office hours: Tuesday 10 am – noon and Friday 11 am – noon
- Review Sessions: Wednesday 10 am - noon, Thursday 10 am noon in classroom (38-121)
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Good luck with the studying and all of your final exams!