

Chemistry 235 Lab Final – Spring 2018 – Format & Study Suggestions

1. Multiple Choice/True False

- This section will focus on safety, techniques, and physical properties.
- The majority of these questions will come from the following experiments: 1-Melting Points, 2-Crystallization, 3-Distillation, 4&5-Chromatography, and 6-Extraction.

2. Physical Properties & Techniques

- This section has additional questions concerning melting point, density, polarity, TLC, CG, and recrystallization.

3. Extraction

- Know the basics of extraction, why it is performed, and how it is performed. Also, be able to fill in an extraction scheme (acidic and basic) such as the one given in experiment 6 figure 6. Pre-Lab question 1 is good practice for this part.
- Know the relative densities of diethyl ether, dichloromethane, and water. If either organic solvent were mixed with water, know which layer would be the top layer and which would be the bottom layer.

4. Reactions and Mechanisms

Study the reactions and mechanism for all of the reactions performed in lab.

- Experiment 9: Hydroboration-Oxidation – Know the reaction, conditions, and how to predict the products.
- Experiment 10: Synthesis of Diphenylacetylene – Know both the reactions and mechanisms for the bromination of an alkene and subsequent elimination of the dibromoalkane to give an alkyne.
- Experiment 11: Substitution Reactions – know the reactions and mechanisms for S_N1 and S_N2 reactions. Also, be able to predict the relative rates of substitution for a variety of substrates.
- Experiment 12: The Williamson Ether Synthesis – Know the reaction and mechanism.

For all of the above reactions, you should also be able to provide the necessary reagents given the starting material and product for a particular reaction. Alternatively, you should be able to predict the product given a starting material and reagent.

5. Stereochemistry

- This section contains various questions testing your understanding of stereochemistry and the relationships of organic compounds.
- Be able to determine molecular relationships (i.e. enantiomers, diastereomers, etc.)
- Be able to distinguish between chiral and achiral compounds.
- Be able to convert a cyclohexane structure into the chair form.
- You are welcome to bring molecular models to use when working on this section.

6. Spectroscopy

You will be provided IR/NMR data tables. These will be identical to those posted to the lab website.

- Be able to use, interpret, and match IR spectra.
- Understand NMR fundamentals such as chemical shift, coupling, integration, etc.
- Be able to predict the 1H NMR for a given molecule.
- Be able to deduce a structure if you are given a molecular formula, IR spectrum, and NMR spectrum.

7. Miscellaneous

- This section will contain questions that examine your understanding of experiments and the calculations used.
- There will be a theoretical and % yield calculation so make sure you know how to do this. **You should bring a calculator!**

It will be beneficial to go over your old quizzes, pre-lab, and post-lab questions. See your lab TA if you need help answering any of these questions.

If your lab section missed a particular experiment due to lab not being held, then questions pertaining to this experiment will not appear on your lab final exam.