

Chemistry 437 — Fall 2003

Physical Chemistry Laboratory II

Instructor: Dr. John B. Miller Office Hours: by appointment
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Lab: 4414/4450 Haenicke, 387-2951
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Class: T 0800-1200, M^cCracken 4210 & 4250

Supplies: Safety Glasses and Laboratory Notebook *with carbons.*

Prerequisite: Chem 430. Chem 431 is required but may be taken concurrently.

Manual: Houser, Schreiber, Lowry, Miller, & Liu *Physical Chemistry Laboratory.*

Reserve Materials: Daniels, *et al.*, *Experimental Physical Chemistry*, 6th ed.
Primary references

Assignments: You will perform six laboratory experiments and develop a seventh as a group project.

Required Experiments

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|---|-------------|
| II-1 – Esterification Equilibrium | (1-2 weeks) |
| II-2 – Ternary Phase Equilibrium | (1-2 weeks) |
| II-3 – Iodination of Aniline (2nd-order kinetics) | (1 week) |
| II-4 – HCl IR Spectroscopy | (1 week) |
| II-5 – UV spectroscopy and Hückel calculations | (2 weeks) |

Selected Additional Experiments [*Pick one*]

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| II-6 – Powder X-ray diffraction | (1 week) |
| II-7a – Conductivity of Electrolytic Solutions | (1-2 weeks) |
| II-7b – Solubility and Ionic Strength | (2 weeks) |

An abstract for each experiment is due by 1700 the day before the experiment is to be performed. The abstract should be about one page and consist of a brief synopsis of the experiment, including important theories, procedures, hazards and cautions relating to the experiment. This is an important part of the preparation for the laboratory.

Note also that the laboratory manual will **not** be permitted inside the classroom. All relevant procedures and warnings must be written in the laboratory notebook **prior to** the laboratory session. This is to ensure that you understand the experiment before attempting to perform it. Carbon copies of data will be collected at the end of each laboratory period.

A short report for each experiment is due by 1700 one week after completion of that experiment. The reports should conform to the guidelines set forth in the laboratory manual. Although extensive background and theoretical development is unnecessary (*i.e.*, minimal introduction), correct data presentation, interpretation, and discussion are essential. Grammar,

punctuation, style, and neatness all count.

The experiment that is to be developed by the group will be determined in consultation with Dr. Miller. Evaluation will be based on experimental procedure development, feasibility, repeatability, and pedagogical value. All members of the group will be evaluated equally for the project.

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| <u>Grading:</u> | Experimental reports | 6 @ 50 points |
| | Prelab abstracts | 7 @ 15 points |
| | Group project | 1 @ 150 point |

Abstracts will be graded overnight.

Laboratory reports will be graded and generally returned within one or two weeks.

If a report is unacceptable, the student will be directed to The Writing Center for help with a rewrite, then both versions will be turned in (with no grading penalty).

Late Work: Late Experimental abstracts will be accepted but given a maximum of five points.

Late Experimental reports will be assessed a penalty of **10% per week**. Reports more than three weeks late will **not** be accepted.

Lab Rules: Safety Goggles or Safety Glasses with side shields (meeting ANSI Z87.1 standard) must be worn at all times in the laboratory.

Contact lenses are not permitted, even if worn with safety goggles.

Open-toed shoes are not permitted. Long pants are suggested. Loose, dangling clothing (scarves, ties, baggy sleeves, long necklaces) should be avoided. If clothing is deemed to be a safety hazard by the instructor, you will be required to change into appropriate attire.