

PHYSICAL CHEMISTRY LABORATORY
REED COLLEGE Chemistry 316
Spring, 2011

LECTURE & LAB INSTRUCTIONS: T, TH 10:30-11:50 a.m. Room C301

INSTRUCTORS: Dr. Dan Gerrity Dr. Juliane Fry

OFFICE HOURS: M 3 - 4 p.m. M 3 - 4:30 p.m.
W 2 - 3 p.m. T 4:30 - 6 p.m.
F 10 - 11 a.m.

TEXTS: **Recommended (NONE Required);** (copies on reserve in the library)

"Experiments in Physical Chemistry," 8th Ed., Garland, Nibler, and Shoemaker. (Earlier editions are fine, too.)

"Spectra of Atoms and Molecules," Peter Bernath.

"Introduction to Molecular Spectroscopy," Gordon M. Barrow.

"Spectra of Diatomic Molecules," Vol. I of *"Molecular Spectra and Molecular Structure"*, G. Herzberg.

GRADING: Your grade in this course will be determined by your performance on: a comprehensive final (30%), the occasional homework assignment (3%), and the quality of your lab work and lab notebook (67%).

Lab write-ups should be thought of as open-book, open-notes take-home exams: You may ask us questions, but you are not allowed to work together or consult with another student on these write-ups!

A deduction of 5% per weekday will be assessed on all lab books handed in late without a valid medical excuse; lab books will not be accepted if they are more than one week late without a valid medical excuse.

In this course you will complete the following experiments:

1. Analysis of the Rotational-Vibrational Spectrum of Gaseous HCl and DCl. (~ 5 weeks)
2. Determination of Molecular Parameters from the Visible Absorption and Time-Resolved Laser Induced Fluorescence Spectra of I₂ Gas. (~ 3 weeks)
3. NMR Determination of the Rotational Barrier in N,N-dimethylacetamide. (~ 3 weeks)
4. Determination of the Lattice Parameters of a Cubic Solid by X-Ray Powder Diffraction. (~ 2 weeks)

This course will also include a brief introduction to group theory, emphasizing its applications in spectroscopy. (~ 3 lectures)

A **bound** laboratory notebook is required (See "*Laboratory Notebook Format*" handout).