CHEM 445

Fall 2008

Atomic and Molecular Spectroscopy

Alphabet Soup: IR, NMR, UV, AA and Fluorimetry

Instructors

Meeting Time: T 2:30-5:30 PM ; **Location:** 41A Hammermill

Dr. Michael W. Justik	**Dr. Jason Bennett**
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Office Hours: MW 12-2 PM	**Office Hours:** T 1-2 PM; W 3-4 PM and F 10-11 AM or by appt

Grading and Policies

Grading Students are expected to maintain a laboratory notebook containing their results, methods for data acquisition and analysis, and conclusions. The grade in each module will be based on the written report or exercise for each experiment. Reports should contain all theoretical background, experimental details, data, calculations, discussion and conclusions using the "Behrend Letters" template. Attendance is required at all laboratory meetings and students will be penalized unless there is a University-approved excuse or are excused at the discretion of the instructor.

Module 1	67%
Module 2	33%
	100 %

To earn a C or better in the course, you must receive a C or better in every module and turn in every report.

Due Dates: Reports are due Sept. 30th, Oct 14th, Oct. 28th, Nov 18th, Dec. 2nd, Dec. 16th.

10% of grade is lost per day for late reports; last report must be turned in by Dec. 16th.

Academic Integrity Penn State puts a very high value on integrity, and violations are not tolerated. Any violation of academic integrity will receive academic and possibly disciplinary sanctions, including the possible awarding of an XF grade. All acts of academic dishonesty are recorded so repeat offenders can be sanctioned accordingly. More information on academic integrity can be found at **http://www.pserie.psu.edu/faculty/academics/integrity.htm** .

Module 1

Dr. Michael W. Justik Sept. 2nd through Oct. 28th.

Experiment 1: ^{1}H and ^{13}C NMR

Students will determine the approximate hybridization of carbon atoms in strained ring systems using ^{1}H-^{13}C coupling constants.

Experiment 2: NOE NMR:

Students will use 1-D and 2-D NOE spectra to determine the absolute configuration of alkenes.

Experiment 3: FT-ATR:

Students will use FT-ATR to determine the concentration of analgesics in OTC preparations.

Experiment 4: Ultraviolet Spectroscopy:

Students will study the SPF factors of sunscreens using UV-vis spectroscopy.

Module 2

Dr. Jason Bennett Nov. 4th through Dec. 9th.

Experiment 1: Atomic Absorption Spectroscopy:

Students will use AA to investigate dissolved metals in environmental water samples and learn how changes in the sample matrix can impact the observed absorbance.

Experiment 2: Fluorimetry

Students will learn how different experimental variables impact the observed fluorescence. The experimental conditions will be optimized to analyze the amount of a compound in a commercial sample.