SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: March 1, 2006

The Department of Chemistry in the College of Arts and Sciences is pleased to offer the following research project for the summer of 2006. Interested students are urged to contact the faculty member(s) directing the project that most interests them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be and if possible, develop a timetable for the twelve-week research period.

MATRIX ISOLATION STUDIES OF REACTIVE INTERMEDIATES

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Project Description

Our research interests lie with the exploration of the mechanisms of important chemical reactions by isolating, identifying and characterizing reactive intermediates that are created and destroyed during the course the reaction. The matrix isolation technique, which involves trapping the intermediates of interest in an argon crystal at nearly absolute zero, is employed to permit the study of very reactive intermediate species. High resolution infrared spectroscopy is one of the primary techniques for characterization of the trapped species, along with theoretical calculations using modern computational chemistry software. The reactions of particular interest are those involving high valent transition metal oxo compounds, which are commonly used as oxidizing agents in organic synthesis, and as models for active sites of enzymes. The goal of this project will be the identification and characterization of reaction intermediates, from which we can obtain a better understanding of the mechanistic details of these oxidation reactions. A student working in my lab will have her own project, learning a variety of characterization techniques, and work with other group members on the overall project.