

MCMICKEN COLLEGE OF ARTS AND SCIENCES

**SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN**

APPLICATION DEADLINE: March 1, 2007

The Department of Chemistry is pleased to offer the following research project for the summer of 2007. 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 reactive oxygen species; include O atoms, singlet O₂ and ozone. These molecules play an important role in fields as diverse and biomedical chemistry and atmospheric chemistry. 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 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.