

Department of Chemistry
COLLEGE OF Arts & Sciences

SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: March 2, 2009

The Department of Chemistry is pleased to offer the following research project for the summer of 2009. 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.

NEW MATERIALS FOR CHEMICAL SENSING

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Project Description

A significant challenge in achieving sustainable development is measuring the human ecological footprint. Meeting this challenge will require the development of new strategies for sensing chemicals with applications ranging from workplace safety to monitoring watershed contaminants. We have recently discovered a new class of materials that undergo a color change in response to important contaminants in the gas phase and aquifers. These materials have potential practical use in chemical sensing and chemical sequestration applications. One example of these compounds are vapochromic platinum salts whose colors and phosphorescence change when exposed to vapors of simple organic molecules, such as dichloromethane, ethanol and acetonitrile. This research project is focused on understanding the mechanism by which these materials respond to analytes by undergoing a color change. Our long-term objective is to learn to tailor this extraordinary behavior. A student working in this area will determine the stoichiometry of analyte uptake, as well as the energetics of the process. In addition, she will screen new materials to determine their analyte selectivity patterns. She will have the opportunity to learn various synthetic and analytical methods that are useful in chemistry, including absorption and emission spectroscopies, thermal gravimetric analysis, X-ray crystallography and NMR spectroscopy. There is flexibility for the student to take the project in any of a variety of directions, depending on her interests and background. No prior research experience is required. Interested students are encouraged to meet with Professor Connick to learn more.

