

**Fall 2009 Seminar Program**

*Friday, October 30<sup>th</sup>*  
WBSH, Room 6030 - 3:15 p.m.



**Dr. Ksenija Glusac**  
Assistant Professor

**Department of Chemistry**  
**Bowling Green State University**

**BGSU.****“Catalytic Oxidations using Flavin-Based Derivatives”****ABSTRACT**

We present a study of flavin chromophore that could potentially be used a chromophore for photocatalytic water oxidation. The compound we investigated is ethylflavinium perchlorate (Et-Fl<sup>+</sup>). It is well-established that Et-Fl<sup>+</sup> in water converts into a pseudobase Et-FIOH. The equilibrium constant for this process is  $K = 10^{-4}$  M, which means that Et-FIOH will be the dominant form at pH values higher than 4. This spontaneous reaction allows us to obtain hydroxyl radicals from a source that is more easily oxidized than water. The potential for one-electron oxidation of water is 2.8 V, while one-electron oxidation of Et-FIOH is only 1.17 V. In aqueous solutions, oxidized Et-FIOH radical cation decomposes within several milliseconds. It is not known what happens with the Et-FIOH radical cation, but there are some indication that the process might involve a release of hydroxyl radical and a recovery of Et-Fl<sup>+</sup> catalyst. In order to investigate the possible photocatalytic cycle of Et-Fl<sup>+</sup>, we synthesized it in a 5-step process starting from 2-amino-2-nitro-benzene. We further performed electrochemical and spectroscopic characterization of the chromophore.

**BIO****PROFESSIONAL PREPARATION**

*Stanford University*

(Palo Alto, CA)

**Advisor:** Prof. Michael D. Fayer

ACS PRF Postdoctoral Fellow, 2004-2006

*University of Florida*

(Gainesville, FL)

**Advisor:** Prof. Kirk S. Schanze

Ph.D., Chemistry, 2004

**Dissertation:** “Photophysics of Platinum-Acetylides”

*Belgrade University*

(Belgrade, Serbia)

**Advisor:** Prof. Radomir N. Saicic

B.S., Chemistry, 1999

Thesis: “Synthesis of Taxol Side Chain and its Derivatives”

**PROFESSIONAL APPOINTMENTS**

August 2006 to present Bowling Green State University (Bowling Green, OH)

*Assistant Professor of Chemistry*