Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Spectroscopic studies on di-pophyrin rotor as micro-viscosity sensor H. DOAN, S. RAUT, J. KIMBAL, Z. GRYCZYNSKI, S. DZYUBA, TCU, M. BALAZ, UW — In typical biological systems the fluid compartment makes up more than 70% percent of the system weight. A variety of mass and signal transportation as well as intermolecular interactions are often governed by viscosity. It is important to be able to measure/estimate viscosity and detect the changes in viscosity upon various stimulations. Understanding the influence of changes in viscosity is crucial and development of the molecular systems that sensitive to micro-viscosity is a goal of many researches. Molecular rotors have been considered the potential target since they present enhanced sensitivity to local viscosity that can strongly restrict molecular rotation. To understand the mechanics of rotor interaction with the environment we have been studied conjugated pophyrin-dimer rotor (DP) that emit in the near IR. Our goal is to investigate the photo physical properties such as absorption, transition moment orientation, emission and excitation, polarization anisotropy and fluorescence lifetime in various mediums of different viscosities from ethanol to poly vinyl alcohol (PVA) matrices. The results imply the influences of the medium's viscosity on the two distinct confirmations: planar and twisted conformations of DP. Linear dichroism from polarized absorption in PVA matrices shows various orientations of transition moments. Excitation anisotropy shows similar transition splitting between two conformations. Time resolved intensity decay at two different observations confirms the two different emission states and furthermore the communication between the two states in the form of energy transfer upon excitation.

H. Doan
TCU

Date submitted: 14 Nov 2014 Electronic form version 1.4