Fluorescence decay studies of anisotropic rotations of the chemically attached hydroxy pyrene probe to the surface of Cab-o-Sil in solvent free environment.

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Optical polarization spectroscopy has been used in the investigation of molecular dynamic of a fluorescent probe (PyOH) in the heterogeneous environment of silica gel in the absence of solvent and oxygen. PyOH was covalently attached through the siloxy group to the surface of Cab-o-sil and the dynamics of fluorescence depolarizations were followed in the steady state and time resolved modes. Comparison of the data from low and high loading of the probe indicates that the probe excimer forms from ground state aggregate (dimeric form). Probe lifetime was a function of probe's concentration and was shortened at high loading. A non-zero anisotropy was observed in nanosecond time scale. For the low loading sample a negative anisotropy increases over 120 ns and then recovers back to zero with a lifetime of 83.1 ns. The rise of anisotropy over 30.7 ns with subsequent decay to the baseline shows a lifetime of 280 ns at 385 nm for the high sample loading. We will discuss the dynamics of molecular motion for the chemically attached probe and compare it with chemically attached PyButO- probe.

Research sponsored by the Division of Chemical Sciences, Geosciences, and Biosciences, Office of Basic Energy Sciences, U.S. Department of Energy, under contract DE-AC05-00OR22725 with Oak Ridge National Laboratory, managed and operated by UT-Battelle, LLC.

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