Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Thickness Dependence of Fluorescence Dynamics in Thin and Ultrathin Polystyrene Films YOHEI TATEISHI, YOHEI OKADA, KEIJI TANAKA, TOSHIHIKO NAGAMURA, Kyushu University — Fluorescence dynamics such as lifetime and rotational relaxation time for 6-(N-(7-nitrobenz-2-oxa-1,3-diazol-4-yl)amino) hexanoic acid (NBD) in polystyrene (PS) solid was examined as a function of film thickness, t. Both times decreased with decreasing thickness once the film became thinner than a critical value, to. Interestingly, in the case of ultrathin films, both times were insensitive to the film thickness. In addition, fluorescence intensity per unit thickness also decreased with decreasing thickness at t $<$ to, meaning that the fluorescence quantum yield was dependent on the thickness at t $<$ to. These results could be explained in terms of a simple three-layer model composed of surface, bulk and interfacial layers.

Yohei Tateishi
Kyushu University

Date submitted: 26 Nov 2007 Electronic form version 1.4