Fluorescence Anisotropy Decays of 4-Cyano-N,N-dimethylaniline in Propylene Glycol Studied by Frequency-Domain Fluorometry

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The fluorescence lifetimes of 4-cyano-N,N-dimethylaniline (CDMA), measured in propylene glycol at 293 K using frequency-domain fluorometry, in the short emission (SE) and long emission (LE) bands are 20 ps and 1.65 ns, respectively. The higher emission anisotropies in the SE band compared to that in the LE band are due to weaker rotational depolarization of fluorescence. Emission anisotropy decays imply that the initial limiting emission anisotropy, r(0), is the same in the SE and LE bands and amounts to 0.28. This reflects the fact that the directions of transition moments in these bands are parallel. In the case of CDMA in propylene and ethylene glycol at temperatures from 293 to 343 K, viscosity more strongly affects the relaxation to the TICT state than does the change in polarity of the solvents used.

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