

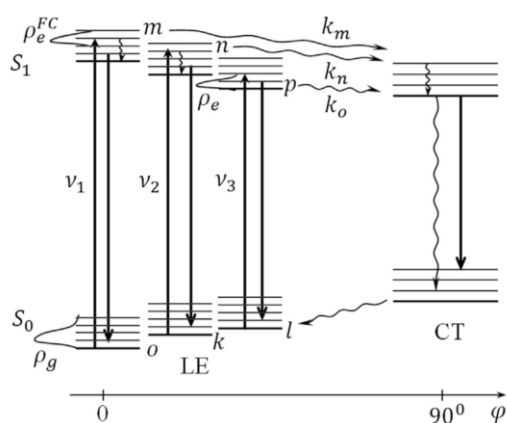
Spectral broadening and REEE in liquid and viscous solutions of DMABN

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Effect of intensity redistribution of two fluorescence bands of N,N'-Dimethylaminobenzonitrile in polar solutions of the different viscosity was studied using selective UV irradiation over the red edge of the main absorption band. The effect being depends on temperature and viscosity, indicated eloquently strong inhomogeneous spectral broadening appearing at the red edge excitation. The conformational broadening exists for electronic transitions in the range of the local excited short wavelength band with weak change of electric dipole moments of the solutes. It was found that the spectral conformational broadening may exists independently on the orientational broadening which is due to the change of solute electric dipole moments in polar media and of thermal environmental fluctuations. When different conformers are excited into upper singlet levels, there is no fast dissipation of excitation energy over different conformational sublevels compared to the charge transfer reaction rates. In this case fluorescence and the charge transfer reaction occur from Franck-Condon sublevels with different rates.



Energy levels of DMABN molecule taking into account conformational states in the LE manifold. Three conformational sublevels *o*, *k* and *l* in the ground electronic state correspond to different twist angles of (ME)₂ group with respect to the benzonitrile moiety. Franck-Condon conformational levels for these states are denoted by *m*, *n* and *p*, respectively. CT state is in essence conformation with twist angle $\varphi = 90^\circ$.

[1] V. I. Tomin, J. M. Dubrovkin, A. Włodarkiewicz, *Journal of Luminescence* **190**, 344 (2017).

[2] V. I. Tomin, A. Włodarkiewicz, *Optics and Spectroscopy* **115**, 85 (2013).