

## The Temporal Dipole Moment of the Solutes Undergoing Charge Transfer in the Excited State

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Important conclusions about a geometrical transformation of molecular structure of quantum systems with charge transfer in the excited state could be obtained from the knowledge of its dipole moment change in time. Unfortunately, until now, available experimental methods allow us to obtain only stationary values of the dipole moments for both the local excited and the charge transfer states.

On the basis of the theory of solvatochromism the time dependence of the dipole moment on the correlation function for the instant spectra kinetics and some other solution parameters has been deduced [1,2]. The time-resolved fluorescence spectra of the 6-propionyl-2-dimethylaminonaphthalene (Prodan) in glycerol solution were measured by means of the apparatus consisting of the solid state Nd:YAG laser with the optical parametric generator as the excitation part, and the spectrograph 2501S (Bruker Optics, USA) jointed with the streak camera C4334-01 (Hamamatsu, Japan) as the detection part [3]. The spectrograph insures spatial resolution of the analyzed light (wavelength axes), whereas the streak camera allows for temporal resolution of the light beam coming out of the spectrograph.

Using the fast Fourier transform and the Debye's equation we obtained for our solution the time dependent dielectric relaxation function [4] which was used for the calculation of the time dependence of the Stokes shift and the electric dipole value of the Prodan in polar solvents. The initial and the final values of dipole moments are close to ones obtained by means of the steady-state spectroscopy methods.

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