

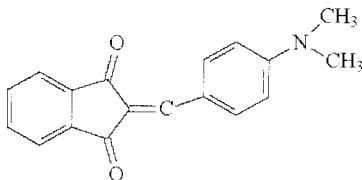
# PHOTOELECTRICAL PROPERTIES OF INDANDIONE CHROMOPHORE IN SOLID STATE

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The optically induced switching of electrical properties is important for investigations of opto-electrical effects in solid state. Investigated indandione type organic molecules consist on acceptor and donor groups bridged by a delocalized  $\pi$ -electron system. Both calculations and experimental data show a reversible highly dipolar photoinduced intramolecular electron transfer (PIET) in 2-(4'-N,N-dimethylaminobenzylidene)indan 1,3-dione (DMABI) molecule [1] (see Fig.1). DMABI molecule irradiated in PIET spectral region at 470nm changes the value of the dipole moment from  $\mu_g = 2.3$  D in the ground state to  $\mu_e = 14.2$  D in the excited state.



*Fig.1* Chemical formula of DMABI molecule

Kelvin probe technique was applied to investigate electrical properties of DMABI thin films. In order to study influence of molecular order on surface potential of films two different types of films were chosen - vacuum evaporated polycrystalline films and polymer films with incorporated and corona poled DMABI molecules. DMABI molecules were irradiated in PIET spectral region and changes of surface potential occurred. When irradiation was switched off reversible changes of surface potential were observed. Spectral dependence of surface photopotential of polymer films with DMABI correlated with absorption spectra of DMABI molecules. In the case of polycrystalline vacuum evaporated DMABI films spectral dependence was more complicated. Our experimental results will be compared with previously studied monolayers of DMABI molecules.

## References:

- [1] E.A.Silinsh, *SPIE Proceedings*, 1997, Vol. 2968, pp.2-12.
- [2] O.Neilands, N.Kirichenko, I.Muzikante, E.Fonavs, L.Gerca, S.Jursenas, R.Valiokas, R.Karpicz, L.Valkunas, *UV Solid-State Light Emitters and Detectors, Proceedings of the NATO Advanced Workshop, NATO Science Series II*, 2004, Vol.144, pp.261-269.