

Turkish Journal of Chemistry

Turkish Journal
of
Chemistry

A highly soluble asymmetric perylene-bis (dicarboximide)-acceptor system incorporating a methylene bridged methoxybenzene-donor: solvent dependence of charge transfer interactions

René M. WILLIAMS

Molecular Photonics Group, Van 't Hoff Institute for Molecular Sciences,
Faculty of Science, Universiteit van Amsterdam, Nieuwe Achtergracht 129,
1018 WS Amsterdam-THE NETHERLANDS
e-mail: R.M.Williams@uva.nl

 [Keywords](#)
 [Authors](#)



chem@tubitak.gov.tr

[Scientific Journals Home](#)
[Page](#)

Abstract: The synthesis and photophysical properties of an asymmetrically substituted perylene-bis (dicarboximide), (PDI), system (1) containing a methylene bridged 4-methoxy-benzene donor and a solubilizing branched C₁₃ alkyl chain are described. As compared to most PDIs, the fluorescence of 1 is strongly quenched in polar (but not in non-polar) solvents due to a photo-induced electron transfer process. Transient absorption spectroscopy and time resolved emission in e.g. acetonitrile indicates that upon excitation the radical anion of the PDI is formed with a rate of ca. $3.5 \times 10^9 \text{ s}^{-1}$, and the charge transfer state has a lifetime of ca. 3 ns. A Frontier Molecular Orbital description is provided, by using DFT calculations.

Key Words: Perylene dyes, photoconductivity, solar cells, LED, 3,4,9,10-perylenetetracarboxylic diimide, excited state properties, photoinduced electron transfer, transient absorption, time resolved emission

Turk. J. Chem., **33**, (2009), 727-737.

Full text: [pdf](#)

Other articles published in the same issue: [Turk. J. Chem., vol.33, iss.6.](#)