Photophysical Properties of Amino- and Dimethylamino Salicylates in Neat and Binary Solvent Mixtures

Marek Aleksiejew, Marek Józefowicz, and Janina R. Heldt

Institute of Experimental Physics, University of Gdańsk, Wita Stwosza 57, 80-952 Gdańsk, Poland

Reprint requests to Dr. J. R. H.; Fax: 048-58341-31-75; E-mail: fizjh@univ.gda.pl

Z. Naturforsch. **60a,** 655 – 666 (2005); received June 1, 2005

The solvation characteristic of 2-methoxy-4-aminobenzoic acid methyl ester (MABAE) and 2-methoxy-4-dimethylaminobenzoic acid methyl ester (MDABAE) in the S_0, S_1(LE) and S_1(ICT) states has been determined by means of solvatochromic shifts in neat and binary solvent mixtures. The multiple linear regression analysis of Kamlet et al. indicates that non-specific dielectric dipole-dipole and specific hydrogen-bonding interactions play almost an equal role in defining the position of the absorption and fluorescence maxima. On the basis of the performed analysis of normalized solvatochromic shifts, it has been shown that both solutes are preferentially solvated. For cyclohexane-ethanol (CH-EtOH) binary mixtures the preferential solvation characteristics in the S_0, S_1(LE) and S_1(ICT) states are determined predominantly by the hydrogen-bonding interactions. For both molecules under study the electric dipole moment in the S_0, S_1(LE) and S_1(ICT) states as well as the outer-sphere solvent reorganization energy (λ_{out}), intramolecular reorganization energy (λ_{in}), and destabilization energy ($E_{\text{dest.}}$) have been determined.

Key words: Binary Solvents; Reorganization Energy; Aminosalicylates.