

ABSTRACT

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ABSTRACT

Excited state proton transfer reactions in aqueous media is among current themes in photochemistry research. Shortly, organic molecules having acid or basic groups and presenting excited state lifetimes long enough, competitive prototropic reactions can occur. This phenomenon is attributed to an isoelectronic state of the ground state molecule and up to seven units of pKa changes have been described.

From the Physical Chemistry investigation viewpoint the study of the neighborhood where the excited species have a potential surface to describe either for the re association reaction or for the ionization followed by solvation, presents an important tool for the analysis of the microenvironment. This feature arises from the optimal spectral properties of the chromophoric groups of this class of compounds, which facilitates monitoring transient species as well by the current technology standards. In this work focused a photobase derivative from quinoline having a suitable polymerizable group.

The 3-allyl-2-methylquinolin-4-ol (HIQ) and the 3-allyl-4-chloro-2-methylquinoline (CLQ) were synthesized and their photoprotropic behavior determined. The first

compound shows both photoacid and photobase character as a function of the solution pH whereas CLQ is a photobase. Following attempts to obtain polymers were unsuccessful either using electrochemical routes.

Given the several applications of di-naphthalimides as new materials, photochemical and photophysical of some derivatives were determined. The properties of these phthalimides arise from the conjugation of the imide electrons with vicinal naphthalic ring. This conjugation confers a high planarity degree and hindering the chromophore solvation. Accordingly high vibronic resolution is observed in both excitation and emission spectra either in the S_0 - S_1 or S_0 - S_2 transitions. Expected solvent spectroscopic effects are thus due to the radical N-imide groups. In this subject several di-imides derivatives were prepared for the use as medium probes. Seven compounds were investigated: N,N'-n-butyl-1,4,5,8-di-naphthalimide (BUNDI); N,N'-(2-chloroethylene)-1,4,5,8-di-naphthalimide (CLNDI); N,N'-(2-bromoethylene)-1,4,5,8-di-naphthalimide (BRNDI), N,N'-2-hydroxyethylene-1,4,5,8-di-naphthalimide (OHNDI); N,N'-(N,N'-dimethylethylenodiamine)-1,4,5,8-di-naphthalimide (DMNDI); N,N'-amine-1,4,5,8-di-naphthalimide (DANDI) and N,N'-1,4,5,8-di-naphthalimide (NDI).

The derivatives studied fully satisfied the expectations leading to either a dimer and aggregate formation or to changes in the intensities or in the vibronic bands intensities relationships (excitation and emission) of the S_0 - S_1 transitions. Here it is shown the excellent quality of these molecules as self and microenvironment probes.

Keywords: quinolines, photochemistry, microenvironment, di-naphthalimides