

Abstract

Photophysical Properties of Some Naphthalimide Derivatives [†]

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Abstract: Naphthalimide derivatives possess many interesting properties such as strong emission, high quantum efficiency, good photostability, thermal stability, etc. The electronic absorption and fluorescence spectra of naphthalimides are sensitive to the polarity of surrounding environment, and these derivatives can be excellent candidates for fluorescent sensors for water detection in solution because the emission is strongly depended on the solvent polarity and it is quenched even at low water levels. In order to find out more information about the excited state dynamics of the naphthalimide derivatives, time-resolved fluorescence experiments were conducted in solvents of different polarities, and lifetimes from 0.5 ns to 9 ns were obtained. The transient absorption map in dioxane, dimethylformamide and methanol in the presence or absence of water revealed ground state bleaching bands (GSB) in the range of 230–290 nm, whereas an absorption band in excited state (ESA) occurred at shorter wavelengths from 210 to 295 nm. At longer wavelength, negative bands appeared, which can be assigned to the stimulated emissions (SE). In addition, the quantum yields with absolute values from 0.01 to 0.87 were found depending on the solvent nature.

Keywords: naphthalimides; transient absorption; water sensing; lifetimes



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