

Excited state intermolecular proton transfer and caging of salicylidine-3,4,7-methyl amine in cyclodextrins.

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The excited state intermolecular proton transfer (EIMPT) of salicylidine-3,4,7-methyl amine (SMA) has been studied using absorbance, steady state and time resolved emission spectroscopy in aqueous and polar aprotic media both in presence and absence of cyclodextrins (CDs). In the ground state, both the closed cis enol form and zwitterionic species coexist in all the solvents used. After encapsulation by β - and γ -CD, only intramolecularly H-bonded cis enol form exists in all the solvent media, while in α -CD both the species coexist. In the excited state, intermolecular proton transfer to water efficiently leads to the formation of anion in absence of CDs. Caging by CDs provokes a 15 (in β -CD) and 10 (in γ -CD) nm blue shift of the emission along with a decrease in intensity of the band, whereas no change is observed in presence of α -CD and glucose. The emission lifetime of anion decreases from 11.8 to 3.4 ns due to the formation of H-bonded complex. Analysis of the spectroscopic data by Benesi-Hildebrand plot shows that SMA forms 1:1 complex in the ground state with β - and γ -CD. Stern-Volmer plot reveals that β -CD is the stronger quencher of SMA anion compared to γ -CD.

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