Electronic spectra of d-ph-d? systems. 1.aminophenol cations as isoelectronic structures of cresols

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The electronic absorption spectra and luminescent properties in the first singlet ?-?* excited states of aminophenol cations in aqueous solutions are studied from a theoretical and experimental point of view. Lifetime and quantum yield measurements are used in the electronic description of the first excited state. Cresols as isoelectronic species of these cationic compounds are used in order to stablish the nature of the main deactivation pathways in excited state. Acid-base equilibrium constants in excited state are determined according to Foster cycle. Para-aminophenol cation is found as an unusual acid species in excited state (pKa* = -4.8). This compound present a double fluorescence spectrum in aqueous solutions due to its high first order dissociation rate constant (log k(d) = 9.95). Non-radiative pathways in the first singlet ?-?* excited state are found as the main deactivation channels in all these isoelectronic compounds.