Investigating the Photoacidity of 8-benzylideneamino-2-naphthol

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Acids are an essential part of many chemical and biological processes, either catalyzing reactions, directly reacting with species, or simply changing the pH of a system. The strength of an acid is characterized by its pK_a, which indicates the extent to which the acid dissociates into H^+ and its conjugate base. Photoacids are a group of molecules which become more acidic when excited by a light source, or their excited state pK_a* is much lower than their ground state pK_a. Photoacids are useful experimental tools, as they provide temporal and spatial control over local pH and as such can be used to control a variety of processes. Additionally, photoacids can be used to explore concepts such as proton transfer and excited state acidity.

$_a$ of 9.52 and a pK_a* of 2.8, and has spectral properties well suited for photochemical studies, such as high emissivity and distinct spectral features between its acid and conjugate base forms. Additionally, 2-naphthol can undergo aromatic substitutions, allowing for a host of functional groups to bond to and influence the photoacidity of 2-naphthol. 8-benzylideneamino-2-naphthol (8BN2OH, Fig 1) is especially interesting as its benzylidene functional group is a combination of an imine and an aromatic ring and as such can be both isomerized and fully conjugated with 2-naphthol. The goal of this project was to characterize the ground and excited state chemistry of 8BN2OH through a combination of absorption and emission spectroscopy and to elucidate the eff*FTEQ*0.e41hough