ACID-BASE ELECTRONIC PROPERTIES IN THE GAS PHASE: PERMANENT ELECTRIC DIPOLE MOMENTS OF A PHOTOACIDIC SUBSTRATE.[a]

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The permanent electric dipole moments of two conformers of 2-naphthol (2HN) in their ground and electronically excited states have been experimentally determined by Stark-effect measurements in a molecular beam. When in solution, 2HN is a weak base in the S_0 state and a strong acid in the S_1 state.[b] Using sequential solvation of the *cis*-2HN photoacid with the base ammonia, we have begun to approach condensed phase acid-base interactions with gas phase rotational resolution.[c] Our study, void of bulk solvent perturbations, is of importance to the larger community currently describing aromatic biomolecule and "super" photoacid behavior *via* theoretical modeling and condensed phase solvatochromism.

[a]Work supported by NSF (CHE-0615755).

[b]A. Weller. *Prog. React. Kinet.* **5**, 273 (1970).

[c]D. F. Plusquellic, X. -Q. Tan, and D. W. Pratt. *J. Chem. Phys.* **96**, 8026 (1992).