

DETERMINATION OF EXCITED STATE DIPOLE MOMENTS OF GAS PHASE MOLECULES. PART II <sup>a</sup>

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The rotationally resolved  $S_1 \leftarrow S_0$  fluorescence excitation spectra of aniline, phenol, styrene, and indole have been obtained in the presence of an external electric field. The Stark effect on the rotational energy level structure allows us to accurately determine the values for the different components of the dipole moment vector in the  $S_1$  electronic state. Electronic excitation can have a considerable effect upon the dipole moment magnitude. An example is aniline, where in  $S_0$ ,  $\mu_a = 1.129$  D and in  $S_1$ ,  $\mu_a = 2.796$  D. The large increase in the dipole moment is a result of changes in the electron distribution near the nitrogen upon absorption of an ultraviolet photon. Time permitting, preliminary results on molecular clusters will also be presented.

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