SYMMETRY DEPENDENCE OF THE RO-VIBRONIC DISTRIBUTIONS OF THE ND_2 A^2A_1 FRAGMENTS FROM THE PHOTODISSOCIATION OF THE A STATES OF ND_3 AND ND_2H AT 193.3 NM

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A rotational and vibrational analysis has been made of the ND_2 $\tilde{A}^2A_1$-$\tilde{X}^2B_1$ emission spectrum produced from the ultraviolet laser induced dissociation of both jet cooled and room temperature deuterated ammonia, ND_3, and di-deutero ammonia, ND_2H. The pattern of the strong features in the emission spectra is very different in the fragmentation of ND_3 and ND_2H, with a much wider range of angular momentum states being observed from the photolysis of the predissociative state of the unsymmetrical parent ND_2H. The analysis is based upon the earlier studies of the electronic spectrum of ND_2, and model calculation based upon the stretch-bender Renner-Teller Hamiltonian. The spectra consist of two types, transitions from a narrow distribution of high angular momentum states in the photolysis of ND_3 and ND_2H, and in the photolysis of ND_2H strong emission from threshold states to three high energy regions of the $\tilde{X}^2B_1$ state. The threshold states are in the third bending level, $v2'=3$, of the ND_2 $\tilde{A}^2A_1$ state, and have no angular momentum about the axis of least moment of inertia, Ka = 0.