CHARACTERIZATION OF THE GROUND $\widetilde{X}\ ^2\Pi$ STATE OF THE R·SH/D (R=Ne, Ar, Kr) COMPLEXES

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Information characterizing the $\widetilde{X}\ ^2\Pi$ state of the R·SH/D (R=Ne, Ar, Kr) complexes has been obtained from two complimentary experimental techniques. The spin-vibronic energy levels have been determined by wavelength resolved fluorescence subsequent to laser excitation of specific vibronic levels of the $\widetilde{A}\ ^2\Sigma^+$ state. Both moderate and high resolution laser induced fluorescence has also been used to characterize the $\widetilde{X}\ ^2\Pi$ state owing to the observation of "hot" bands from excited spin-vibronic levels of Ne·SH/D.
The experimental data have been used to construct very simple models for the ground state potential energy surface for each complex. These models show that the most stable conformation for each complex is linear H-bonded, but the barrier to isomerization to the S-bonded complex is quite low. The overall bonding is somewhat weaker and more isotropic than the corresponding hydroxyl complexes.