TWO-PHOTON SPECTROSCOPY OF THE NO-NE COMPLEX

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In our recent work on NO-Ar complexes we have shown how the rotational structure of the two-photon spectra can be analyzed in terms of the spherical tensor components of the two-photon absorption operator characteristic to the transition in the bare NO molecule.[a,b] Due to spectral congestion we have not yet been able to analyze the NO-Ar spectra in the region of the Rydberg states $F^2\Delta$ and $H^2\Sigma$, $H'^2\Pi$. In this contribution, we will present the analogous results for the NO-Ne complex. Because of the weaker interaction, the various band systems correlating with the Rydberg states $C^2\Pi$ (v_{NO}=1,2, and 4), $E^2\Sigma$, $F^2\Delta$, and $H^2\Sigma$, $H'^2\Pi$ are well separated from each other. Apart from the H state for which a five membered stretch progression is observed, the spectra assigned to the lower Rydberg states show only transitions to two stretch vibrational levels. Spectra associated with the vibrational levels of the $C^2\Pi$ state show very different predissociation behavior compared to the corresponding NO-Ar spectra. The results indicate important differences in electronic state mixing between the $C^2\Pi$ and $B^2\Pi$ states upon complexation.

[a] H. Meyer, J. Chem. Phys. 107, 7732(1997).
[b] H. Meyer, J. Chem. Phys. 107, 7721(1997).