

UV R2PI Spectra of p-difluorobenzene van der Waals Complexes

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The real world generally involves systems of great complexity. The study of molecular dimers and clusters (produced in a supersonic molecular jet) provides an important link with condensed phase behavior. The structure, energetics and intramolecular dynamics of van der Waals clusters are of considerable importance for the basic understanding of intermolecular interactions. There have been extensive spectroscopic studies involving aromatic molecules [1, 2, 3, 4, 5]. Here we study the dimers with p-C₆H₄F₂ and other molecules (see Fig. 1), applying the combination of resonant two-photon ionization spectroscopy (R2PI) with a time-of-flight mass spectrometer. The broadening of the spectral bands is due to the coexistence of two or more conformations.

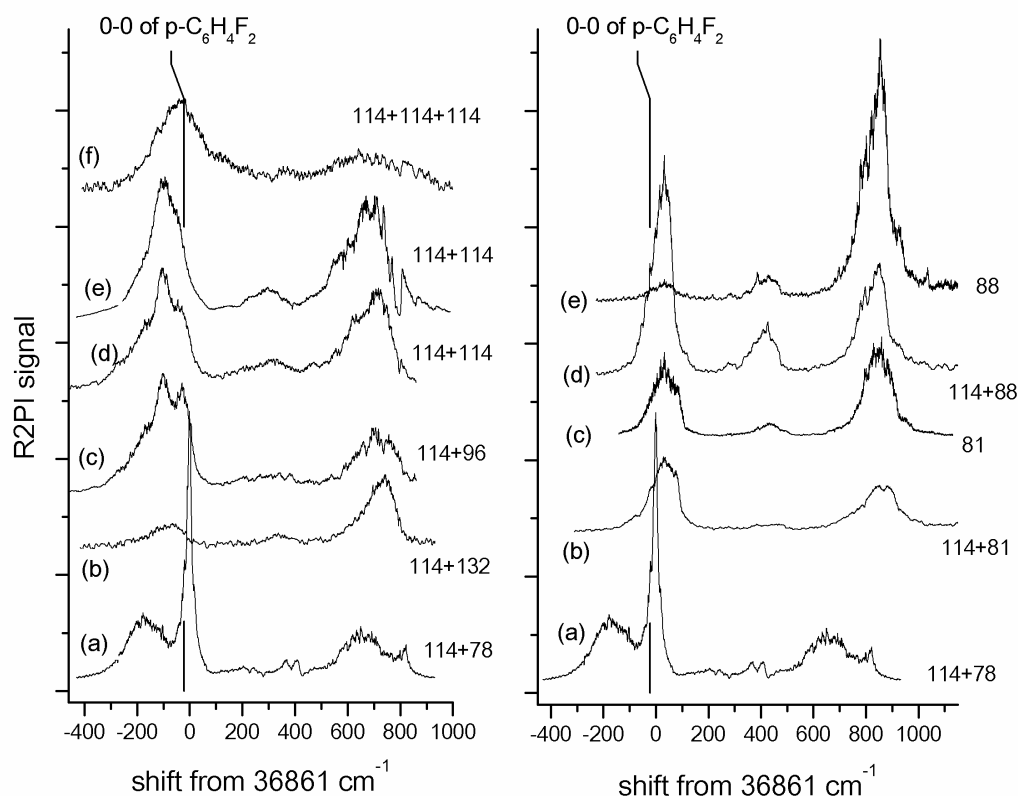


Fig. 1: Mass selected 1C-R2PI $S_1 \leftarrow S_0$ spectra of p-C₆H₄F₂ with various clustered molecules. Left side: (a) with benzene, (b) with 1,3,5-trifluorobenzene, (c) with fluorobenzene, (d) and (e) homodimer, (f) homotrimer. Right side: (a) with benzene, (b) and (c) with N-methylpyrrole, (d) and (e) with p-dioxane. The origin band of bare p-C₆H₄F₂ is at 36839 cm⁻¹.

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