HIGH RESOLUTION UV SPECTROSCOPY ON 2-FLUOROPHENOL AND THE BENZOIC ACID DIMER

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The use of a narrow band UV laser in combination with a supersonic molecular beam expansion enabled us to rotationally resolve the UV spectra of both 2-Fluorophenol and the Benzoic Acid Dimer. The cooling of vibrational and rotational degrees of freedom, caused by the expansion, has two advantages. On the one hand it considerably simplifies the spectra, since only the lowest rotational levels in the electronic ground state are populated. On the other hand it permits the stabilization of structural variants and molecular clusters.
Analysis of the rotationally resolved LIF spectra provides detailed information about the dynamics and strucure of the measured molecules in both their ground and electronically excited states.
In order to distinguish between the two different isomers of 2-Fluorophenol the 36799 cm^{-1} band (the strongest of the two) has been measured and analyzed. In order to study proton tunnelling in intermolecular hydrogen bonds we measured the origin band of the benzoic acid dimer at 35724 cm^{-1}. The results of both measurements will be presented in this talk.