

PROPANOL CLUSTERING IN ARGON MATRIX:
2D FTIR CORRELATION SPECTROSCOPY

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S u m m a r y

The dynamic FTIR spectra of propanol in the argon matrix have been measured using a thermal perturbation by heating the sample from $T = 11$ K to 30 K stepping by 1 K. The 2D Fourier-transform infrared (FTIR) absorption correlation analysis has been carried out, the main attention being concentrated to the region of propanol O–H stretching vibrations at 3000–3700 cm^{-1} . The peaks of monomers, two conformers of open dimer, and the cyclic structures from a dimer to a pentamer have been resolved and studied in more details. Analyzing the dependences of the integral band intensities of various aggregates on the temperature, it has been deduced that monomers and dimers act in the initial clustering stage as the main “building units” whose diffusion sustains the formation of the higher H-bond structures in the matrix. The full width at half height (FWHH) for each band has been processed as a function of the aggregation number (n). It is found that the FHWW is a perfectly linear function of n for all cyclic aggregates $n \geq 2$. The resonance broadening has been proposed to be the most reliable mechanism for the formation of diffuse O–H stretching bands in the matrix isolated clusters.