FAR-INFRARED SYNCHROTRON-BASED SPECTROSCOPY OF FURAN: ANALYSIS OF THE $\nu_{14} - \nu_{11}$ PERTURBATION AND THE ν_{18} AND ν_{19} LEVELS

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The ν_{14} vibrational level of furan lies 603 cm^{-1} above the ground vibrational state. It is the lowest lying vibrational level for which a transition from the ground state is allowed. Other groups have conducted rotational analyses on fundamental bands of furan at 745 cm^{-1} (ν_{13})[b], 995 cm^{-1} (ν_7)[c] and at 1067 cm^{-1} (ν_6)[d]. We have taken the rotationally resolved spectrum of the *c*-type ν_{14} band at the Canadian Light Source synchrotron with a Bruker IFS125HR Fourier transform spectrometer operating at 0.00096 cm^{-1} resolution, and have found it to be perturbed by the ν_{11} band at 600 cm^{-1}, for which transitions from the ground vibrational state are forbidden. By taking the spectra of the *b*-type ν_{18} fundamental band and of the very weak *c*-type ν_{18}- ν_{11} band we have been able to analyze the ν_{14}-ν_{11} perturbation. We have also analyzed the spectrum of the *b*-type ν_{19} fundamental band.

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