DYNAMIC ROTATIONAL SPECTROSCOPY OF METHYL VINYL ETHER MEASURED BY CHIRPED-PULSE FOURIER TRANSFORM MICROWAVE (CP-FTMW) SPECTROSCOPY

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Methyl vinyl ether has two large amplitude internal rotation coordinates. Internal rotation about the vinyl-oxygen bond leads to distinct conformational structures. The conformational potential has a well-defined *cis* conformational well and a broad well around the *trans* conformation with a low barrier to planarity. In addition, there is a second internal rotation motion about the methyl-oxygen bond. In this case, the barrier to methyl internal rotation is dependent on the conformational geometry. When methyl vinyl ether is vibrationally excited in the 3000 cm^{-1} region (the CH stretch fundamental region) the vibrational energy can flow between these two internal rotation coordinates producing both conformational isomerization and methyl group gyroscopic effects in the dynamic rotational spectrum. Despite the potential for complicated overall rotational motion from these coupled large amplitude motions, we observe a structured rotational spectrum that remains qualitatively the same for all excitation energies in the CH stretch fundamental region. An analysis of the spectrum to extract the conformational isomerization rate in the case of coupled internal rotation is presented.