

Cis-METHYL VINYL ETHER: THE ROTATIONAL SPECTRUM UP TO 600 GHz

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Astronomical observation of dimethyl ether,^a methyl ethyl ether^b and vinyl alcohol^c places the methyl vinyl ether among the species of potential interstellar relevance. The millimeter and submillimeter-wave transitions pertaining to the vibrational ground state and the first excited states of the methoxy, ν_{24} , and methyl, ν_{23} , torsional modes and the in-plane bending mode, ν_{16} , of the *cis*-methyl vinyl ether have been measured and analyzed in the frequency region from 50 to 600 GHz. A significant Fermi-type and Coriolis interactions between the $\nu_{24} = 1$ and $\nu_{23} = 1$ states have been observed and the rotational spectra were analyzed using an effective two-state Hamiltonian explicitly involving corresponding coupling operators. A sets of spectroscopic constants for the ground state as well as for all three excited states reproducing the observed spectrum within the experimental uncertainty provide sufficiently precise information for the astronomical search for methyl vinyl ether.

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