

THE MICROWAVE SPECTROSCOPY STUDY OF 1,2-DIMETHOXYETHANE

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With Pulsed-Jet Fourier Transform MicroWave (PJ-FTMW) spectroscopy and Stark modulated Free Jet Millimeter-Wave absorption (FJ-AMMW) spectroscopy, the rotational spectra of two conformers of 1,2-Dimethoxyethane were identified and characterized. Besides the normal species, the spectra of all the mono-substituted ^{13}C isotopologues in natural abundance were also measured. By fitting the rotational transitions split by the methyl internal rotations using both XIAM and ERHAM programs, the spectroscopic parameters were obtained and compared. The rotational constants indicated the conformers to be TGT and TGG', respectively. With the rotational constants of the normal and ^{13}C species, the coordinates of the substituted carbon atoms could be calculated with Kraitchmann's equations. The carbon-frameworks further confirmed the assignment of the two conformations. The V_3 barriers of the two methyl groups' internal rotations were also experimentally determined.