

FOURIE TRANSFORM MICROWAVE SPECTRUM OF DIMETHYL ETHER DIMER

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The microwave spectrum of dimethyl ether dimer (DME)₂ has been observed using a Fourier transform microwave spectrometer at Shizuoka University from 5 to 18 GHz. The sample of 1% dimethyl ether in Ar was used to form the complex in a supersonic expansion. Sets of characteristic triplet lines with similar spectroscopic properties were found and assigned to be the $J = 4 \leftarrow 3$, $J = 5 \leftarrow 4$, and $J = 6 \leftarrow 5$ transitions of (DME)₂. The microwave spectrum of the six isotopomers (DME)₂, (DME-d₆)₂, (DME-¹³C₂)₂, (DME-d₆) ··· (DME), (DME-¹³C₂) ··· (DME), (DME) ··· (DME-¹³C₂) have been assigned, leading to the precise spectroscopic constants. From the rotational constants of these six isotopomers molecular structure of dimethyl ether dimer was determined, being found to have C_s symmetry and to be bound with three O ··· HC hydrogen bonds. The barrier height to internal rotation of the methyl group has been determined from the observed *A-E* splitting.