THE MILLIMETER-WAVE SPECTRUM OF *TRANS* -ETHYL METHYL ETHER ($CH_3CH_2OCH_3$)

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Dimethyl ether is an abundant interstellar molecule in regions of high-mass star formation known as "hot cores." It has been suggested by a variety of astronomers that ethyl methyl ether, a somewhat more complex ether, is a good candidate for detection in such sources. Previous studies of the rotational-torsional spectrum of the lowest energy, or *trans*, conformer of ethyl methyl ether have been limited to frequencies under 40 GHz. We report here the measurement and analysis of the spectrum of this conformer in its ground torsional state through 340 GHz and through quantum numbers $J = 58$ and $K = 6$. Measurements have been made both via a phase-locked spectrometer in Cologne and via the "FASSST" spectrometer at Ohio State. The analysis of the spectrum with the splittings caused by interactions with two different internal rotors has been achieved with an effective rotational Hamiltonian.[a] Over 1100 frequencies have been fitted to experimental precision with only 14 parameters.

[a] P. Groner *J. Chem. Phys.* **107**, 4483 (1997).