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Coherence-converted population transfer FTMW-IR double resonance spectroscopy of CH_3OD in the asymmetric CH-Stretch Region
SYLVESTRE TWAGIRAYEZU, DAVID S. PERRY, The University of Akron, JUSTIN L. NEILL, MATT T. MUCKLE, BROOKS H. PATE, University of Virginia — State-selected infrared spectra of jet-cooled CH_3OD in the asymmetric CH stretch region (2890-3020 cm^{-1}) were obtained using the E-species microwave transitions: $1_0 \leftarrow 1_{-1}$ at 18.957GHz; $2_0 \leftarrow 2_{-1}$ at 18.991GHz; and $3_0 \leftarrow 3_{-1}$ at 19.005GHz. The title technique enables the facile assignment of complex torsion-rotation spectra with multiple interacting vibrational bands. The two asymmetric CH-stretch fundamentals (ν_2: 3000.2 cm^{-1} and ν_9: 2955.7 cm^{-1}) are analyzed along with about 15 additional bands in the region of the binary combinations of the CH bends (2890-2950 cm^{-1}). The number of observed vibrational bands indicates that the CH stretch bright states couple first to the binary CH bend combinations, and then to higher order combinations of the normal modes. The $J\prime$-dependence of the rotational structure is regular, but the $K\prime$-dependence is complicated by multiple strong $K\prime$-dependent interactions between vibrational states.

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