

SPECTROSCOPY AND DISSOCIATION DYNAMICS OF THE 1-METHYLALLYL RADICAL

M. GASSER, J. A. FREY, J. M. HOSTETTLER and A. BACH, *Laboratorium für Organische Chemie, ETH Zürich, CH-8093, Switzerland.*

The $\tilde{A} \leftarrow \tilde{X}$ band system of jet-cooled 1-methylallyl radical (C_4H_7) was observed for the first time using resonance-enhanced multiphoton ionization combined with electronic ground state depletion spectroscopy. Analysis of the vibronic structure reveals transitions to the non-planar \tilde{A} valence excited state with an electronic origin for the *Z*-isomer of 1-methylallyl at $23\,979\text{ cm}^{-1}$.

Time- and frequency-resolved photoionization of the hydrogen atom product from electronically excited 1-methylallyl radical and its isotopologue $CH_3C_3D_4$ provides information on the dissociation dynamics.

The measured dissociation rates and kinetic energy release combined with results from high level *ab initio* calculations suggests unimolecular decomposition to 1,3-butadiene and hydrogen with no evidence for nonstatistical behavior in dissociation.

