

## HIGH-RESOLUTION INFRARED SPECTRA OF THE ACETYLENIC C-H AND O-H STRETCHES OF PROPARGYL ALCOHOL

DAVID A. McWHORTER, EVAN HUDSPETH and BROOKS H. PATE, *Department of Chemistry, University of Virginia, Charlottesville, VA 22901.*

The high-resolution infrared spectra (5 MHz) of the acetylenic C-H and O-H stretches of propargyl alcohol (HCCCH<sub>2</sub>OH) have been assigned using the microwave-infrared double-resonance spectroscopy capabilities of an electric-resonance optothermal spectrometer. For the acetylenic C-H stretch, which is predominantly an a-type vibrational band, the double-resonance capabilities permit definitive rotational assignments of the dense rovibrational spectrum. The high resolution infrared spectrum shows extensive local perturbations which fragment the transition moment into a set of transitions containing from 2-15 components. This fragmentation is the spectroscopic signature of intramolecular vibrational energy redistribution (IVR). Using these techniques, we have been able to provide rotational assignments in the range of  $J=0-6$  and  $K_a=0-2$ . Although the observed state density rapidly increases at low  $J$ , indicative of rotationally mediated coupling between the rovibrational states, we find that the measured state density saturates near  $J=4$ . This effect demonstrates limited access into the full rovibrational state density. The O-H stretch vibrational band displays much broader spectra for single rovibrational bright states, providing a demonstration of mode-specific IVR dynamics.