TIME-RESOLVED FTIR EMISSION SPECTROSCOPY OF THE ν_1 CH STRETCH MODE OF THE KETENYL (HCCO) RADICAL

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The ν_1 CH stretch, a previously uncharacterized mode of the ketenyl (HCCO) radical, was detected at 3230cm^{-1} through time-resolved Fourier transform infrared emission spectroscopy. Ro-vibrationally excited ketenyl and ethyl (CH_2CH_3) radicals were generated, with near unit quantum efficiency, via the 193 nm photodissociation of ethyl ethynyl ether [a].

$$\text{HCC-O-}\ CH_2CH_3 + h\nu\ (193\ \text{nm}) \rightarrow HCCO + CH_2CH_3$$

IR emission from the photoproducts was detected with both temporal and frequency resolution. Spectral assignments were made based upon comparison with theoretical calculations as well as 2D correlation analysis[b].

[a] M. J. Krish, J. L. Millerm, L. J. Butler, H. Su, R. Bersohn, and J. Shu, J. Chem. Phys. 119, 176(2003).
[b] W. McNavage, and H. L. Dai, J. Chem. Phys. 123, 184104(2005).