TIME-RESOLVED FTIR EMISSION SPECTROSCOPY OF THE $\nu_1$ CH STRETCH MODE OF THE KETENYL (HCCO) RADICAL

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The $\nu_1$ CH stretch, a previously uncharacterized mode of the ketenyl (HCCO) radical, was detected at 3230 cm$^{-1}$ through time-resolved Fourier transform infrared emission spectroscopy. Rot-vibrationally excited ketenyl and ethyl (CH$_2$CH$_3$) radicals were generated, with near unit quantum efficiency, via the 193 nm photodissociation of ethyl ethynyl ether $\text{C}_2\text{H}_5\text{C}=$.

$$\text{HCC}=\text{CH}_2\text{CH}_3 + \hbar\nu \ (193 \text{ nm}) \rightarrow H\text{CCO} + \text{CH}_2\text{CH}_3$$

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$^a$.
