VIBRATIONAL SPECTROSCOPY OF A TRANSIENT SPECIES THROUGH TIME-RESOLVED FOURIER TRANSFORM IR EMISSION SPECTROSCOPY: THE VINYL RADICAL

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An approach for detecting the vibrational spectrum of transient species is demonstrated on the vinyl radical. Photodissociation of carefully chosen precursors at a selected photolysis wavelength produce highly vibrationally excited radicals. IR emission from these radicals is then measured by time-resolved Fourier Transform Spectroscopy with nanosecond time resolution. This technique has the advantage of probing a wide frequency range of the IR spectrum in a single experiment. Using this method, all 9 vibrational bands of the vinyl radical, generated from 4 different precursors, are obtained for the first time. The cyanovinyl radical has also been studied and previously unknown vibrational assignments were made.