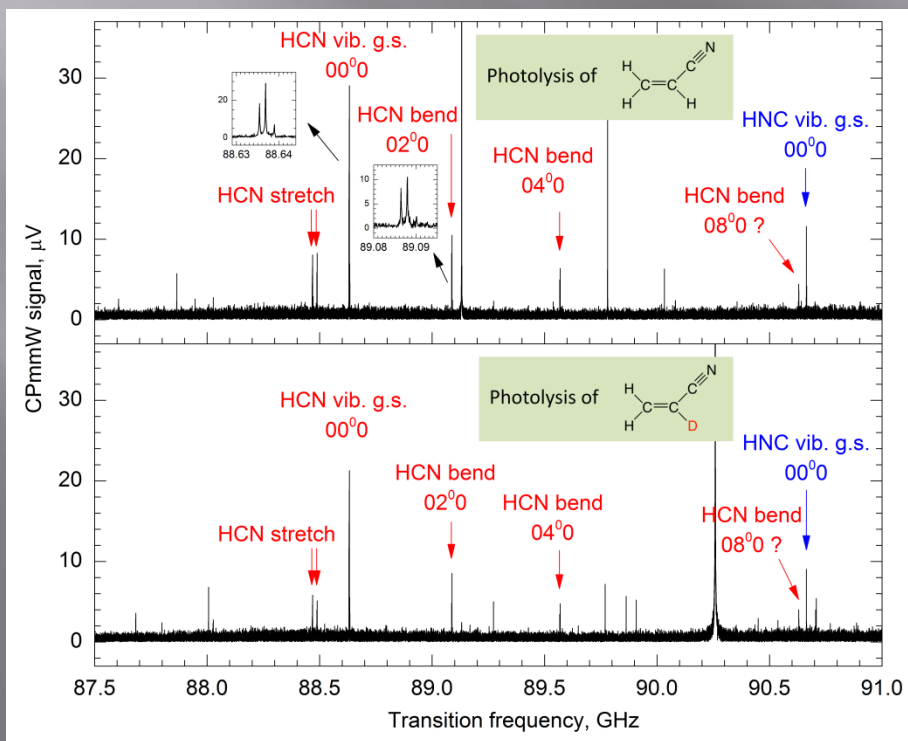


Unimolecular and Bimolecular Reactions Studied with the Chirped-Pulse Millimeter-Wave (CPmmW) Spectroscopy

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I. A classical unimolecular reaction was revisited using CPmmW spectroscopy.

Vibrational population distribution of photolysis products as well as their relative abundances are measured with CPmmW. The dominant role of the four-center elimination mechanism in photolysis of vinyl cyanide has been demonstrated.

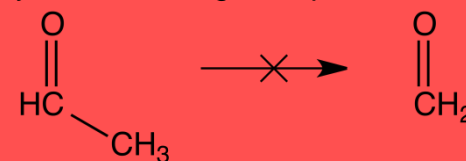


II. Hydrogen atoms can be an effective catalyst for breaking up large organic molecules and converting biomass to biofuel.

We have demonstrated the H-atoms-mediated thermal decomposition of acetaldehyde by CPmmW spectroscopy of pyrolysis reaction products.

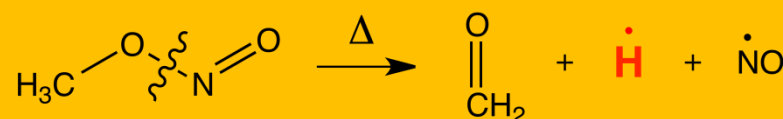
Acetaldehyde does not decompose unimolecularly to formaldehyde even at high temperatures

Stop



Methyl nitrite decomposes at $T = 1000$ K, and can be used as a convenient source of H-atoms

Ready



If methyl nitrite is added, acetaldehyde breaks apart following the H-atoms attack

Go!

