

Room-Temperature Chirped-Pulse Fourier Transform Microwave Spectroscopy for the Study of Radical Reaction Dynamics

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Microwave (MW) spectroscopy is extremely sensitive to the size and shape of molecules. Recent advances in instrumentation have drastically reduced the time to acquire a spectrum, and so we can now use MW spectroscopy as a probe of chemical processes. In our experiments we hope to use a UV source to initiate a chemical reaction. At 10 – 20 mTorr, molecules collide with each other about once per microsecond, and so by monitoring MW spectra as a function of time, we should be able to follow reactions step by step. We are optimizing the UV source and radical precursors to be able to simultaneously follow the destruction of reactants and the creation of products. To date we have obtained and assigned room temperature MW spectra of a number of precursors and closed-shell forms of potential reaction products.

