ELECTRIC DISCHARGE VS. EXCIMER LASER PHOTOLYSIS: A COMPARISON OF TWO METHODS USED TO PREPARE UNSTABLE MOLECULES FOR FOURIER TRANSFORM MICROWAVE SPECTROSCOPIC STUDY

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Although the use of an electric discharge has proved to be effective in the preparation of unstable species for spectroscopic study, this method has the disadvantage of being a "black magic" approach which completely lacks selectivity. If the molecule of interest happens to be prepared in a high enough yield that its spectrum is strong enough to be measured, then this technique has the advantage of being simple, relatively inexpensive, and easy to implement; however, if the spectra are weak or even un-observable because too few molecules are being generated, then the high selectivity of a laser photolysis preparation method is preferred.

We are currently in the process of coupling an excimer laser to our existing pulsed jet cavity Fourier Transform microwave spectrometer with the hope that this will complement our electric discharge nozzle in allowing us to prepare unstable molecules, free radicals, and even ions for high resolution spectroscopic study. Details on some studies carried out using our electric discharge apparatus will be discussed, and a to-date report on the state of our experiments involving the excimer laser will be given.