JET-COOLED, BROAD RANGE NEAR-IR SCAN OF REACTIVE INTERMEDIATES USING CAVITY RINGDOWN SPECTROSCOPY

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A technique has been developed for obtaining broad range scans of jet-cooled radicals using cavity ringdown spectroscopy. The talk will describe a method that uses a slit jet expansion in tandem with an electrical discharge to produce the reactive intermediates and obtain rotational temperatures of 15-30 K and effective vibrational temperatures of 0 K. The spectrum can be recorded by scanning the second stokes of an H_2 Raman shifted YAG-pumped dye laser with bandwidth of ≈ 0.1 cm^{-1}. This technique has been used to obtain the jet-cooled $\widetilde{A} - \widetilde{X}$ spectra of the NO_3 radical and the 2,1-hydroxypropyl peroxy radical (2,1-HPP). Obtaining the jet-cooled spectra helped to identify hot bands present in the room temperature spectrum of NO_3 and also helped to identify cold, low-frequency fundamental bands present in the 2,1-HPP spectrum.

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