OBSERVATION OF THE $\widetilde{A}^2$A$'$ - $\widetilde{X}^2$A$''$ ELECTRONIC TRANSITION OF VINOXY RADICAL USING CAVITY RINGDOWN SPECTROSCOPY

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Free radicals are key components in the oxidation of hydrocarbons, both in combustion and in our atmosphere. More specifically, the vinoxy radical, CH_2CHO, is a prototypical alkenoxy radical, which is known to play an important role in the reaction of O(^{3}P) and OH with olefins and olefinic radicals. While the $\widetilde{B}$ - $\widetilde{X}$ transition of vinoxy has been studied in considerable detail over the last twenty years, the $\widetilde{A}$ - $\widetilde{X}$ transition remains relatively unexplored because of its much weaker absorption cross-section. Due to its low oscillator strengh, cavity ringdown spectroscopy (CRDS) has been applied to study the $\widetilde{A}$ - $\widetilde{X}$ near-IR electronic transition of vinoxy radical. In addition, *ab initio* calculations were conducted in order to predict the $\widetilde{A}$ - $\widetilde{X}$ origin frequency, as well as to aid in assigning other vibrational structure in the spectrum.