

# ZERO ELECTRON KINETIC ENERGY PULSED FIELD IONIZATION (ZEKE) SPECTROSCOPY OF CdCH<sub>3</sub> AND ZnCH<sub>3</sub>

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The two-color ( $1 + 1'$ ) REMPI and ZEKE spectra of the CdCH<sub>3</sub> and ZnCH<sub>3</sub> radicals are reported for the first time. Based upon the observed intensities in the ZEKE spectrum for CdCH<sub>3</sub>, via transitions to different vibrational levels of the  $\tilde{A}^2E$  intermediate state, the band previously assigned as the upper spin-orbit component of the vibrationless level of the  $\tilde{A}^2E \leftarrow \tilde{X}^2A_1$  transition in neutral CdCH<sub>3</sub> is reassigned. This band which has now been observed in both LIF and REMPI experiments, is reassigned as the  $6_0^1$  band of the lower spin-orbit component,  $^2E_{1/2}$ . The ZEKE spectra, taken via various intermediate rovibronic levels, are used to reveal rovibrational structure of the CdCH<sub>3</sub> and ZnCH<sub>3</sub> cations and to measure the adiabatic ionization energies for both radicals. These radicals belong to the  $C_{3v}$  point group and are therefore subject to a Jahn-Teller interaction in the  $\tilde{A}$  state, which allows a broader range of  $K'$  states to be accessible in the LIF and REMPI experiments thereby enabling access to a broader range of  $K$  states for the ions in the ZEKE experiment. The resolved  $K$  structure in the level with one quanta of  $\nu_6$  excitation in the ion enables estimates of both the rotational constant  $A$  and the coriolis coupling constant  $a\zeta_t$  to be made. Vibrational frequencies and assignments for the ions will be reported.