ZERO ELECTRON KINETIC ENERGY PULSED FIELD IONIZATION (ZEKE) SPECTROSCOPY OF $ZnCH_3$ AND $MgCH_3$

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The two-color $(1+1')$ REMPI and ZEKE spectra of the $ZnCH_3$ and $MgCH_3$ radicals have been obtained. The $ZnCH_3$ radicals were generated in a supersonic free jet expansion by ArF excimer photolysis of $Zn(CH_3)_2$ while $MgCH_3$ was generated by ablation of a Mg rod in the presence of a methyl source, generally either $Sn(CH_3)_4$ or CH_3CN. The ZEKE spectra, taken via various intermediate vibronic levels of the $\widetilde{A}\ ^2E$ state, are used to reveal the vibrational structure of the $ZnCH_3$ and $MgCH_3$ cations and to measure the adiabatic ionization energy for each radical. These radicals belong to the C_{3v} point group and are therefore subject to a Jahn-Teller interaction in the $\widetilde{A}$ state, which allows a broader range of vibrational states to be accessible in the LIF and REMPI experiments, thereby enabling access to a broader range of vibrational states for the ions in the ZEKE experiment. Vibrational frequencies and assignments of the ions will be reported.