We report a combined experimental and theoretical study on the vibronic structure of CH$_3$F$^+$ due to the Jahn-Teller effect. Experimentally, we have measured a high resolution ZEKE spectrum of CH$_3$F up to 3500 cm$^{-1}$ above the ground state. Theoretically, we performed an ab initio calculation based on the adiabatic model. The adiabatic potential energy surfaces (APES) of CH$_3$F$^+$ have been calculated at the MRCI/CAS/avq(t)z level and expressed by Taylor expansions with normal coordinates as variables. The energy gradients for the lower and upper APES, the derivative couplings between them and also the energies of the APES have been used to determine the coefficients in the Taylor expansion. The spin-vibronic energy levels have been calculated by accounting all six vibrational modes and their couplings. The experimental ZEKE spectra were assigned based on the theoretical calculations.

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