

OPTICAL STARK SPECTROSCOPY OF CHLORO-METHYLENE, HCCI

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The optical spectrum of chloro-methylene, HCCI, has been studied for more than 40 years by both conventional^a and laser-based^{bcd} spectroscopy. Surprisingly, numerous visible bands have yet to be characterized, due in part to known perturbations. Furthermore, the permanent electric dipole moment, μ_{el} , for any state has yet to be determined. Here we report on the field-free and optical Stark spectrum of the $\tilde{A}^1A''(060) - \tilde{X}^1A'(000)$ band system. A cold molecular beam sample was produced by skimming the output of a pulsed discharge source and the spectrum recorded at a resolution of approximately 30 MHz via LIF detection. The field-free spectrum was analyzed to produce an improved set of spectroscopic parameters for the $\tilde{A}^1A''(060)$ state. The Stark induced shifts were analyzed to determine the values of the a -component of μ_{el} for the $\tilde{X}^1A'(000)$ state of 0.498(8)D. Small perturbations in the $\tilde{A}^1A''(060)$ state will be described.

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