VIBRONIC STRUCTURE OF THE CCS RADICAL IN THE $\tilde{A}^3\Pi_i$ STATE

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The CCS radical was generated in a supersonic jet using a pulsed-discharge of a mixture gas: C_2H_2 0.35%/CS_2 0.35% in Ar. Ro-vibronic spectra of the radical were measured with a LIF spectroscopic method in a spectral region from 900 to 600 nm, corresponding to the $\tilde{A}^3\Pi_i - \tilde{X}^3\Sigma^-$ transition. In the near infrared region where a photomultiplier has no sensitivity, an MODR technique using an FTMW spectrometer was employed.

Some of the observed bands could be assigned to the $\tilde{A}(v_1 00) - \tilde{X}(000)$ and $\tilde{A}(v_1 10) - \tilde{X}(000)$ transitions (v_1 = 1, 2). For the $\tilde{A}(v_1 00)$ level, rotational constants were determined using a $^3\Pi$ Hamiltonian. Although the $\tilde{A}^3\Pi_i(v_1 10)$ vibronic level splits into seven levels by the Renner-Teller interaction, transitions to only two of the seven levels from the ground state were observed. Using the two transition frequencies of the $\tilde{A}(v_1 10)$ level, the spin-orbit constant, and the position of the $\tilde{A}(v_1 00)$ level, the Renner parameter $|\epsilon|$ and the harmonic frequency of the bending motion ω_2 in the $\tilde{A}$ state are estimated to be 0.235 and 402.39 cm^{-1}, respectively.