

ELECTRONIC TRANSITIONS OF THE HC₄S AND HC₆S RADICALS STUDIED BY LASER INDUCED FLUORESCENCE SPECTROSCOPY

MASAKAZU NAKAJIMA, YOSHIHIRO SUMIYOSHI and YASUKI ENDO, *Department of Basic Science, Graduate School of Arts and Sciences, The University of Tokyo, Tokyo 153-8902, Japan.*

Laser induced fluorescence spectra of two new vibronic band systems have been observed by discharging a mixture gas, C₂H₂ 0.5%/CS₂ 0.3% diluted in Ar, in a supersonic jet. All the bands were assigned to ${}^2\Pi_{3/2} - {}^2\Pi_{3/2}$ transitions by measuring rotationally resolved spectra. Based on the chemical composition and the ground state combination differences, the spectral carriers were assigned to the HC₄S and HC₆S radicals. The homogeneous width of the excitation spectra of the HC₆S radical is larger than that of HC₄S by 0.02 cm⁻¹ (FWHM), which was interpreted as the lifetime broadening of the excited state, corresponding to 270 ps. Vibronic origin of HC₄S is located at 500.5 nm, and that of HC₆S is at 589.6 nm. Main progressions of both the vibronic systems are assigned to the excitations of the C-S stretching modes, of which frequencies were determined to 505 cm⁻¹ for HC₄S, 435 cm⁻¹ for HC₆S.