HIGH-RESOLUTION LASER-INDUCED FLUORESCENCE (LIF) SPECTROSCOPY OF THE DEUTERATED ISOTOPOMERS OF THE METHOXY RADICAL

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Our high-resolution laser-induced fluorescence (LIF) spectroscopy apparatus has been improved to study the deuterated isotopomers of the methoxy radical under jet-cooled conditions (T$\sim$2K). Doppler-free absorption spectra of iodine molecule were recorded simultaneously for absolute calibration,[a] while relative calibration was done using the fringes of a new etalon. The spectral resolution (FWHM) for methoxy was limited to $\sim$300MHz by residual Doppler broadening and unresolved hyperfine structure. The center of spectral lines could be determined to $\sim$1/5 the FWHM with a comparable absolute accuracy ($1\sigma\sim$50MHz). The 3_0^2 and $(6')_0^1$ bands of the $\tilde{A}^2A_1-\tilde{X}^2E_{3/2}$ transition for CHD_2O and CH_2DO have been recorded, as well as the 3_0^2 and 6_0^1 bands for CH_3O and CD_3O. Rotational and fine structure for all bands has been resolved and assigned. Details of the analyses will be presented in the following talks.

[a] H. Kato, *Doppler-Free High Resolution Spectral Atlas of Iodine Molecule*, Japan Society for the Promotion of Science, (2002).