ULTRAHIGH-RESOLUTION SPECTROSCOPY OF DIBENZOFURAN $S_1 \leftarrow S_0$ TRANSITION

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Dibenzofuran is one of the prototypical molecule of toxic dioxins and it is great important to investigate the excited-state dynamics. We have observed low-resolution spectra for the vibronic structure of the $S_1\ ^1A_1 \leftarrow S_0\ ^1A_1$ transition of jet-cooled dibenzofuran. Several vibronic bands are stronger than the 0_0^0 band. These bands are found to be the A-type transition which are enhanced by intensity borrowing through the vibronic coupling with the $S_2\ ^1B_2$ state. [a] Rotationally resolved ultrahigh-resolution spectra of jet-cooled dibenzofuran for the 0_0^0 and 0_0^0+443 cm^{-1} band have been observed. Several thousand lines were assigned and these molecular constants were determined. [b] We have extended the high-resolution spectroscopic measurement for several vibronic bands up to 1335 cm^{-1}. We analyzed observed rotational lines and determined the molecular constants for each vibronic bands. The Zeeman broadenings of the rotational lines were also observed, and the J, K-dependence were studied. As a result, the observed Zeeman effects could be explained to be originating from the magnetic moment of the $S_1\ ^1A_1$ state induced by mixing with $S_2\ ^1B_2$ state by J-L coupling.

[a] M. Baba, K. Mori, M. Yamawaki, K. Akita, M. Ito, S. Kasahara, and T. Yamanaka, *J. Phys. Chem. A* **110**, 10000 (2006).
[b] M. Yamawaki, Y. Tatamitani, A. Doi, S. Kasahara, and M. Baba, *J. Mol. Spectrosc.*, **238**, 49 (2006).