

## 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. <sup>a</sup> Rotationally resolved ultrahigh-resolution spectra of jet-cooled dibenzofuran for the  $0_0^0$  and  $0_0^0+443 \text{ cm}^{-1}$  band have been observed. Several thousand lines were assigned and these molecular constants were determined. <sup>b</sup> We have extended the high-resolution spectroscopic measurement for several vibronic bands up to  $1335 \text{ cm}^{-1}$ . 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.

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<sup>a</sup>M. Baba, K. Mori, M. Yamawaki, K. Akita, M. Ito, S. Kasahara, and T. Yamanaka, *J. Phys. Chem. A* **110**, 10000 (2006).

<sup>b</sup>M. Yamawaki, Y. Tatamitani, A. Doi, S. Kasahara, and M. Baba, *J. Mol. Spectrosc.*, **238**, 49 (2006).