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

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Dibenzo-furan 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 $S_0 \ ^1B_2$ 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 $S_0 \ ^1B_2$ state by $J$-$L$ coupling.