HIGH RESOLUTION INFRARED SPECTROSCOPY OF CO_2-Br_2

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The absorption spectrum of the weakly bound complex CO_2-Br_2 has been observed by probing the asymmetric stretch of the CO_2 moiety near 2349 cm^{-1}. Complex was formed by supersonic expansion of the mixture of CO_2 and bromine vapor with use He as a carrier gas. The CO_2-Br_2 was found to have a linear structure with a Br atom close to the center of mass of the system. The isotope substitution of the other Br provided the splitting of the observed peaks into two. The measured rotational and distortional constants for ^{79}Br and ^{81}Br are B$' = 0.0148044(26)$, D$' = 6.43(17) \times 10^{-8}$, B$'' = 0.0146591(26)$, D$'' = 6.01(18) \times 10^{-8}$, and B$' = 0.0146765(27)$, D$' = 6.42(18) \times 10^{-8}$, B$'' = 0.0145322(28)$, D$'' = 6.03(19) \times 10^{-8}$, respectively (in cm^{-1}). The experimental values will be compared with ab initio calculation results and the floppiness of the molecule will be discussed.