

## Fourier-transform Spectroscopy and Deperturbation Analysis of the $A^1\Pi(v = 0)$ Level in the $^{12}\text{C}^{17}\text{O}$ Isotopologue

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The present study focuses on a first analysis of spectroscopic data for the  $A^1\Pi(v = 0)$  level in the  $^{12}\text{C}^{17}\text{O}$  isotopologue. Fourier-transform spectroscopy (1.71 m Bruker IFS 125HR) was used to obtain the Ångström ( $B^1\Sigma^+ - A^1\Pi$ )(0, 0) band spectrum under  $0.018\text{ cm}^{-1}$  resolution. The discharge was conducted in the air-cooled, carbon hollow-cathode lamp. The temperature of dc-plasma at the center of the cathode was about 1000 K. The estimated absolute calibration uncertainty ( $1\sigma$ ) was  $0.005\text{ cm}^{-1}$ . The fitting uncertainty of the line frequency measurements was estimated to be  $0.005\text{ cm}^{-1}$ . The spectrum was combined with high-resolution photoabsorption measurements of the  $^{12}\text{C}^{17}\text{O}$   $B^1\Sigma^+ - X^1\Sigma^+(0, 0)$  and  $C^1\Sigma^+ - X^1\Sigma^+(0, 0)$  bands<sup>2</sup> recorded with an accuracy of  $0.01\text{ cm}^{-1}$  using the vacuum ultraviolet Fourier-transform spectrometer, installed on the DESIRS beamline at the SOLEIL synchrotron. An effective Hamiltonian used in deperturbation analysis was performed up to  $J = 39$ , quantitatively addressing complex, multistate interactions with the  $e^3\Sigma^-(v = 1)$ ,  $d^3\Delta(v = 4)$ ,  $a^3\Sigma^+(v = 9)$ ,  $D^1\Delta(v = 0)$ , and  $I^1\Sigma^-(v = 0, 1)$  rovibrational levels. The comprehensive data set, 281 spectral lines belonging to 3 bands, was included in the fit. The  $A^1\Pi$  and perturber states were described in terms of a set of deperturbed molecular constants, spin-orbit and  $L$ -uncoupling interaction parameters, individual and equilibrium constants, term values, as well as isotopologue-independent spin-orbit and rotation-electronic perturbation parameters. This work is a member of a sequence of studies analysing the  $A^1\Pi(v = 0)$  level in the CO isotopologues<sup>3,4,5,6,7</sup>

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