$A^2\Pi$ ~ $X^2\Sigma^+$ INTERACTION PARAMETERS FOR $^{12}C^{16}O^+$, $^{13}C^{16}O^+$ AND $^{14}C^{16}O^+$ FROM DEPERTURBATION ANALYSES OF $A^2\Pi(v') \rightarrow X^2\Sigma^+(v'')$ BANDS

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Several $A^2\Pi \rightarrow X^2\Sigma^+$ emission bands of CO^+, for which the A-state vibrational level is perturbed, have been recorded photographically. The well known $A(v' = 0)$ ~ $X(v^* = 10)$ and $A(v' = 5)$ ~ $X(v^* = 14)$ perturbations between the $A^2\Pi$ and $X^2\Sigma^+$ states of $^{12}C^{16}O^+$, previously analysed by Coxon and Foster[a], have been reinvestigated by analysis of the 0 - 2 and 5 - 0 bands. The standard deviations of the least squares fits are typically about 0.02 cm^{-1}. Similarly, the $A(v' = 1)$ ~ $X(v^* = 11)$ interaction in $^{13}C^{16}O^+$, first identified by Jakubek[b] in an analysis of the 0 - 1 band of the $B^2\Sigma^+ - A^2\Pi$ system, has been studied by a deperturbation analysis of the rotational structure in the $A^2\Pi(v' = 1) \rightarrow X^2\Sigma^+(v'' = 0)$ band. For $^{14}C^{16}O^+$, the corresponding $A(v' = 2)$ ~ $X(v^* = 11)$ interaction has been observed for the first time by analysis of the 2 - 0 and 2 - 1 bands of the $A - X$ system. The expected isotopic self-consistency of the interaction parameters α and β from individual bands of the three isotopomers is discussed.

[a] J. A. Coxon and S. C. Foster, J. Mol. Spectrosc. 93, 117 (1982).
[b] Z. Jakubek, J. Mol. Spectrosc. 131, 207 (1988).