The Rotational Spectrum of (^{17}O)Ketene

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The rotational spectrum of $H_2CC^{17}O$ in the ground vibrational state has been investigated between 20 and 330 GHz. From 82 R-branch transitions a set of rotational constants and several centrifugal distortion constants could be derived, employing the Watson S-reduction formalism. The obtained rotational constants in MHz are: $A = 282071.6(223)$, $B = 10013.4764(28)$, $C = 9655.9118(24)$. The nuclear quadrupole coupling structure of the $J_{K_{a'}K_{c'}} \leftarrow J_{K_a K_c} = 1_{01} \leftarrow 0_{00}$ line has been recorded by means of molecular beam Fourier transform microwave spectroscopy allowing the determination of the nuclear quadrupole constant $\chi_{aa} = -1.534(54)$ MHz (without considering the spin-rotation interaction). A recalculation of the r_s-structure has also been carried out, using the constants of the new isotopomer. The result agrees with the values reported by East et al. in 1995. This is, to our knowledge, the first reported investigation of the $H_2CC^{17}O$ rotational spectrum.

Key words: Rotational Spectra; Structure; Ketene; Isotopomer.