The Millimeterwave Spectrum of Four Rare Ketene Isotopomers

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The pure rotational spectra in the ground vibrational state of (1,2-^{13}C)ketene, $H_2{}^{13}C{=}^{13}CO$, (D_2,1-^{13}C)ketene, $D_2C{=}^{13}CO$, (D_2,2-^{13}C)ketene, $D_2{}^{13}C{=}CO$, and (D_2,^{18}O)ketene, $D_2C{=}C^{18}O$, have been observed in the frequency region 200 – 350 GHz. All the spectral lines have been measured in natural abundances with a source modulated millimeterwave spectrometer.

From the measured R-branch transitions a set of rotational and centrifugal distortion constants for each isotopomer could be derived, using the Watson S-reduction formalism. Further, the rotational spectra of the two isotopomers (4,5-D)ketene, D_2CCO, and (4-D)ketene, DHCCO, which were already measured several years ago, have been extended to higher *J*-values and higher frequencies, as it is the case for all investigated isotopomers of this work. As a result of these studies a calculation of a mass-dependent structure will be the topic of a next paper.

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