STRUCTURE STUDY OF THE CHIRAL LACTIDE MOLECULES BY CHIRPED-PULSE FTMW SPECTROSCOPY

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Lactide is a six member cyclic diester with two chiral centers that forms from lactic acid in the presence of heat and an acid catalyst. It can form either a homo-chiral (RR) structure with both methyl groups equatorial or a hetero-chiral (RS) structure where one methyl group is equatorial and the other methyl group is axial. Structurally lactide is similar to lactic acid dimer; however, the kinked ring is covalently bonded and two waters are lost. And unlike lactic acid dimer, which has a very small dipole moment, the dipole moment of lactide is on the order of 3 Debye. Here the microwave spectra of the highly rigid homo- and hetero-chiral lactides are presented, which were first assigned in a heated lactic acid spectrum where the chemistry took place in the reservoir nozzles. Further isotopic information from a commercial sample of predominately homo-chiral lactide was obtained leading to a Kraitchman substitution structure of the homo-chiral lactide. Preliminary results of the cluster of homo-chiral lactide with one water molecule attached are also presented.