ALDOPENTOSES IN THE GAS PHASE: ROTATIONAL SPECTRA OF D-XYLOSE, D-ARABINOSE, D-LYXOSE AND 2-DEOXY-D-RIBOSE

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A new experimental approach chirped-pulse Fourier transform microwave (CP-FTMW) spectrometer combined with a laser ablation (LA) source[a,b] has been used to investigate the conformational distribution of aldopentoses. From their laser ablated crystalline solids, two conformers of α-D-xylopyranose, four of β-D-arabinopyranose, five of β-D-lyxopyranose and two α- and four β- of 2-deoxy-D -ribopyranose have been identified in the supersonic jet on the basis of the experimental rotational constants extracted from the analysis of the spectra. The five monosubstituted ^{13}C species of the most abundant conformer of D-xylopyranose have been observed in their natural abundance, taking advantage of the sensitivity of our spectrometer. The anomeric effect and cooperative hydrogen bonding have been found to be the main factors which control the conformational behavior of the observed conformers.

[a] G. G. Brown, B. C. Dian, K. O. Douglass, S. M. Geyer, S. T. Shipman, B. H. Pate, *Rev. Sci. Instrum.* **2008**, *79*, 053103.
[b] S. Mata, I. Peña, C. Cabezas, J. C. López, J. L. Alonso, *J. Mol. Spectrosc.* **2012**, *280*, 91.