THE JET-COOLED ROTATIONAL SPECTRUM OF N,N'-BIS(HYDROXYMETHYL)UREA AND ITS PHOTO-FRAGMENTED SPECIES

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A novel approach based on laser ablation of solid organic precursors has been recently proposed for the laboratory *in situ* generations of new chemical species.[a] The chemical compounds generated in the laser ablation process are cooled in a supersonic expansion and probed by eyes of high-resolution microwave spectroscopy. This "micro-laboratory" enhances the scope of *in situ* experiments using precursors not typically accessible to traditional techniques such as electric discharge and pyrolysis. In this contribution, N,N'-Bis(hydroxymethyl)urea is chosen as a precursor. It contains a C=O functional group and two pairs of –NH and –OH groups, very appealing from the astrochemical point of view. Guided by the theoretical predictions, we assigned the precursor's rotational spectrum (four conformers), and then we focused on tuning up our experiment to achieve the experimental conditions that maximize the photo-fragmentation. A detailed analysis of the spectrum revealed the generation of hydroxymethylurea and the simultaneous formation of other species in the jet, showing that the laser ablation of solid organic precursors constitutes an innovative tool in generating new chemical species.

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[a] L. Kolesniková, I. León, E. R. Alonso, S. Mata, and J. L. Alonso, *Angew. Chem. Int. Ed.* 2021, 60, 24461.