VUV PHOTOIONIZATION SPECTROSCOPY OF 2-AMINO PROPIONITRILE

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Astronomical searches for gas phase amino acids have so far been unsuccessful. Numerous tentative claims and subsequent debates on possible occurrence of these prebiotic compounds in interstellar gas have thus far been unconclusive. Since the conclusive non-detection of glycine[1] attention of astrochemists has turned to precursors of amino acids. One of those is amino acetonitrile (AAC; $H_2C(NH_2)CN$) that has indeed been detected in Sagittarius B2(N) in 2008[2]. This molecule can be transformed into glycine by simple hydrolysis. Its VUV photoionization has been studied earlier by our group[3]. Here we present a VUV spectroscopic study of 2-amino propionitrile (2-APN; $HC(NH_2)(CH_3)CN$) which is the methylated homologue of AAC and, in contrast to the latter, a chiral molecule. 2-APN has been searched for towards Sagittarius B2(N) but no detection has been reported[4]. Hydrolysis of 2-APN yields α-alanine which preserves the chirality of the central carbon atom. We used the DELICIOUS 3 spectrometer installed as a permanent end station on the DESIRS beamline at the Synchrotron SOLEIL facility in France, in order to record phoionization mass spectra and slow photoelectron spectra of the racemic mixture in the gas phase (between its IE and 15.5 eV). Theoretical calculations have been also performed mainly to analyze dissociative photoionization pathways of 2-APN. Astrophysical implications of our study will be discussed.

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[1] M.R. Cunningham, P.A. Jones, P.D. Godfrey, D.M. Cragg, I. Bains, M.G. Burton, P. Calisse, N.H.M. Crighton, S.J. Curran, T.M. Davis, J.T. Dempsey, B. Fulton, M.G. Hidas, T. Hill, L. Kedziora-Chudczer, V. Minier, M.B. Pracy, C. Purcell, J. Shobbrook, T. Travouillon, Mon. Not. R. Astron. Soc. 2007, 376, 1201-1210.

[2] A. Belloche, K.M. Menten, C. Comito, H.S.P. Mueller, P. Schilke, J. Ott, S. Thorwirth, C. Hieret, Astron. Astrophys. 2008, 482, 179-196.

[3] A. Bellili, M. Schwell, Y. Bénilan, N. Fray, M.-C. Gazeau, M. Mogren Al-Mogren, J.-C. Guillemin, L. Poisson, M. Hochlaf, J. Mol. Spectrosc. 2015, 315, 196-205.

[4] H. Mollendal, L. Margulès, A. Belloche, R.A. Motiyenko, A. Konovalov, K.M. Menten, J.-C. Guillemin, Astron. Astrophys. 2012, 538, A51

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