Contribution ID: **52** Type: **Poster**

Gas-phase spectroscopic studies of [dAMP-H]^- in cryogenic 16-pole wire trap

Tuesday, 28 June 2022 17:11 (3 minutes)

Recent studies suggest that the pharmacological activity of biomolecular drugs associates with their gas-phase geometries but not with the aqueous-phase structures [1]. In this scenario, the gas-phase study of biomolecules becomes more relevant with emerging RNA and DNA-based drugs by contributing knowledge to their biologically active geometry. 2'-deoxyadenosine-5'- monophosphate(dAMP) is a monomer of the genetic material, deoxyribonucleic acid (DNA). UV photodamage of DNA occurs mainly due to the absorption of the UV radiation by the aromatic ring present in their nitrogenous bases (Adenine, Thymine, Guanine, and Cytosine) [2,3,4]. The photodissociation spectroscopy of deprotonated 2'-deoxyadenosine-5'-monophosphate anion is measured with UV laser light in the range 220-280 nm with a linewidth of 0.02 nm. Electrospray ionization (ESI) is a widely used technique for generating complex biomolecular ions in the gas phase with little or no fragmentation [5]. The study is carried out by confining the anions generated from electrospray ionization, in a cryogenic 16-pole wire trap maintained at 2.9 K [6]. He buffer gas collision is employed for thermalizing the trapped ions to this temperature.

References

[1] Pereverzev, Aleksandr Y., and Oleg V. Boyarkin. Phys. Chem. Chem. Phys. 19(5), 3468-3472, 2017.
[2] Sunil Kumar, S., Pérot-Taillandier, M., Lucas, B., Soorkia, S., Barat, M., & Fayeton, J. A. J. Phys. Chem. A 115(38), 10383-10390, 2011.
[3] Yang, X., Wang, X. B., Vorpagel, E. R., & Wang, L. S. PNAS 101(51), 17588-17592, 2004.
[4] Stokes, S. T., Grubisic, A., Li, X., Jae Ko, Y., & Bowen, K. H. J. Chem. Phys. 128(4), 01B621, 2008.
[5] Fenn, J. B., Mann, M., Meng, C. K., Wong, S. F., & Whitehouse, C. M. Mass Spectrum. Rev. 9(1), 37-70,1990.
[6] Geistlinger, K., Fischer, M., Spieler, S., Remmers, L., Duensing, F., Dahlmann, F., Endres, E. and Wester, R. Rev. Sci. Instrum., 92(2), 023204, 2021.

Primary author: MOHANDAS, Salvi (IISER TIRUPATI, University of Innsbruck)

Co-authors: DAHLMANN, Franziska (Univerity of Innsbruck); ENDRES, Eric (University of Innsbruck); KUMAR S, Sunil (IISER Tirupati); WESTER, Roland (Univerisity of Innsbruck)

Presenter: MOHANDAS, Salvi (IISER TIRUPATI, University of Innsbruck)

Session Classification: Posters