SYNCHROTRON RADIATION INDUCED PHOTOFRAGMENTATION OF SMALL MOLECULAR CLUSTERS

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We studied photofragmentation of small gas-phase acetamide and acetic acid clusters produced by supersonic expansion source using time-of-flight (TOF) ion mass spectrometry combined with tunable vacuum-ultraviolet synchrotron radiation [1]. The studied hydrogen-bonded clusters could be considered as simple model systems to explore many biologically important photochemical processes (*e.g.* ionization, radical release and radiation damage). Acetamide and acetic acid clusters contribute to the C–H···O=C, O–H···O=C, and N–H···O=C types of hydrogen bond interactions that are responsible, for example, for the structural organization of proteins. The photoionization of such clusters (especially dimers) makes it possible to probe the consequent dynamics along those hydrogen bonds, excluding the additional influence of the environment that could mask some of the reaction mechanisms. The main consequences of the photoionization process, as well as the effect of clusterization conditions on the photofragmentation of clusters, will be discussed.

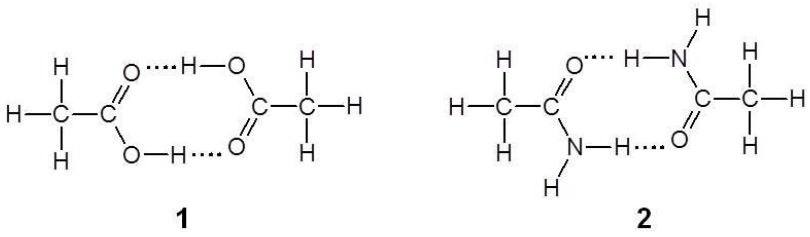

Fig. 1. The molecules studied: (1) acetic acid dimer, (2) acetamide dimer.

References

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