Fragmentation of Valine by electron impact

Jaroslav Kočišek, Dušan Kubala, Štefan Matejčík

kocisek@yahoo.com

The gas phase electron impact ionization of Valine has been studied in crossed electron-molecule experiment built in Department of Experimantal Physics, CU Bratislava [1]. The main components of experimental setup - Quadrupole Mass Analyzer (QMA) and Trochoidal Electron Monochromator (TEM) allow us not only to study mass spectra of produced fragment ions but also to precisely determine activation energies for particular reaction channels.

After detail electron attachment study [2] we continue our investigation of Valine molecule in present electron impact study. At first measurements of MS was performed to determine the most important reaction channels. These were subjected to further analysis. Ionization energy of molecule was acquired from energy dependent ionization yields measured for parent ion m/z=117. Afterwards activation energies for selected particular reaction channels have been determined from near threshold measurements of electron energy dependent relative ionization cross sections.

Presented data are in demand for many fields of chemistry, physics and medicine concerning biologically relevant molecules. Especially we would highlight their importance for computational chemistry of amino acids and explanation of several important processes in living organisms.

[1] Stano, M. et al: Electron impact ionization of CH4: ionization energies and temperature effects,
J. Phys. B: At. Mol. Opt. Phys., 36, 2003, 261–271

[2] Papp, P. et al: Dissociative electron attachment to gas phase valine: A combined experimental and theoretical study, Journal of Chemical Physics, Volume 125, Issue 20, 2006, pp. 204301-204301-8