

In the present work we study properties of clusters of small heteroatomic molecules with biological relevance by several experimental methods based on molecular beams. In the first experiment structure and dynamics of size-selected charged pyrrole clusters have been studied by means of molecular beam scattering experiment. Small neutral Pyn clusters were produced in Py/He expansions and larger mixed PynArm clusters in Py/Ar expansions, and the scattering experiment with a secondary beam of He atoms was used to select the neutral clusters of different sizes. The complete size-selected fragmentation patterns for the neutral dimer to tetramer after an electron impact ionization at 70 eV from the measurements of the angular and velocity distributions at different fragment masses. In second experiment photolysis of size selected pyrrole, imidazole and pyrazole clusters has been investigated. Comparison with the photolysis of an isolated molecules and between studied systems has been made. Clusters were photolyzed at 243 and 193 nm and the kinetic energy distributions of the H-photofragments have been measured and analyzed. Finally the mass spectra of the fragments after multiphoton ionization have been measured. The significant influence of the cluster environment to the photolytic behavior was observed and discussed.