

Miniaturization of devices to study chemical interactions and processes in liquid samples has led to the emergence of microfluidics and construction of *lab-on-a-chip* systems. Present work was devoted to implementation, development and testing of microfluidic systems with detection by confocal Raman microscopy and surface enhanced Raman scattering under the conditions of training department. Several options of performing standard macroscopic measurements in microscopic scales were explored. A method for measuring thermal stability of biopolymers in microsystems with contactless detection of temperature has been designed and tested. Furthermore, possibilities for studying the SERS effect within microfluidic channels were explored. It was demonstrated that the microfluidic chips provide promising opportunity to study hydrodynamics of liquids at microscopic level and chemical reactions and kinetics.