

The thesis covers the main results of research on atmospheric pressure plasma modification of biopolymers for the preparation of functional materials. Sodium alginate solutions processed by means of a plasma jet were successfully used for the casting of foils with advanced mechanical properties. It was observed that alginate's final performance does not only depend on the originating biopolymer viscosity but is significantly influenced by the type of working gas used for plasma modification. The antibacterial effect of alginate foils incorporated with almond essential oil was demonstrated as a promising extension of alginate's application in food storage. The results of plasma-initiated degradation of high-molecular-weight chitosan were studied in terms of its water-solubility. The analysis of structural properties demonstrated deep destruction of chitosan including the fragmentation of low-molecular-weight oligomers presented in the control sample. The fraction perfectly soluble in water was obtained using plasma processing as was demonstrated by NMR. The plasma solution system was demonstrated to be a suitable tool for enhancing chitosan's degradation for a possible application in crop protection.