

The theoretical part deals with basic characteristics of low-temperature, low-pressure plasma. It describes the principles of preparation of nanocomposite films using this type of plasma and also the etching process in chemically active plasma. It further explains the basic principles of methods used to characterize our samples.

The experimental part describes the process of optimization of chemically active plasma (O_2/Ar) employed for etching of plasma polymer films. After finding suitable etching parameters several types of films were prepared. First, films of plasma polymer and then nanocomposite films composed of metal and plasma polymer. Afterwards the samples were treated in defined conditions of oxygen plasma. The aim was to study the physico-chemical properties of these films, especially their chemical composition using X-ray photoelectron spectroscopy, and wettability. Attention was given to the change of the water contact angle as a function of etching time and morphology of the sample. In case of oxygen etching ageing of the film was studied. By increasing of roughness superhydrophobic (SHF) film was prepared.