

Polymeric materials are thanks to their advantageous volume properties and due to their relatively low price interesting for various applications. However, the possible use of common polymers is hampered by their low surface energy that leads to poor adhesion of subsequent coatings and limited ability to bind biomolecules. One of the strategies to increase the surface energy is modification of polymer surface by atmospheric plasma.

In this study, we have investigated effect of atmospheric pressure dielectric barrier discharge generated in air on poly(ether-ether-ketone). We estimated plasma composition by optical emission spectroscopy as well as monitored temperature of the polymer during the treatment in order to verify applicability of this plasma source. Subsequently changes in morphology, chemical composition and surface energy of polymeric samples after the plasma treatment were determined. We proved that surface energy increases with increasing surface density of polar functional groups and that plasma causes changes in morphology of the studied polymer surface. We determined the etching rate of poly(ether-ether-ketone) in dependence on the supplied power. Optical properties remained unchanged indicating that also volume properties were not affected by plasma. Finally we tested the binding of biomolecules on the surface of untreated and treated polymer.