Martyna GUŁA[1], Zuzanna WARSKA[1], Aleksandra KOPICA[1], Alicja PIĄTEK[1], Anna TARATUTA[2], Magdalena ANTONOWICZ[2]

[1]SKN Synergy, Department of Biomaterials and Medical Device Engineering, Faculty of Biomedical Engineering, Silesian University of Technology, 40 Roosevelta Street, 41-800 Zabrze, Poland
[2]Department of Biomaterials and Medical Device Engineering, Faculty of Biomedical Engineering, Silesian University of Technology, 40 Roosevelta Street, 41-800 Zabrze, Poland

THE EFFECT OF E-CIGARETTE SMOKE ON CHANGING THE PHYSICOCHEMICAL PROPERTIES OF THE SURFACE OF BIOMATERIALS USED IN DENTISTRY

Keywords: tobacco smoke, acrylic materials, dentistry, tobacco warmers

Nowadays, the use of electric cigarettes and tobacco warmers, such as the IQOS device, is gaining in popularity. There are many types of tobacco cartridges available on the market, varying in chemical content. To date, many studies prove that smoking tobacco products contributes to the likelihood of implant failures by irritating the peri-implant tissue, which can result in uncovering of part of the implant and direct exposure to cigarette smoke. However, current research has mainly focused on the problem of the effect of smoke on the tissue rather than on the dental devices themselves. This research focuses on acrylic materials used in the manufacture of complete dentures, partial dentures, basic denture plates and materials used in the lining of dentures. Depending on the patient's needs and the specifications of the prosthetic restoration, the materials available on the market differ in their properties.

In this work, the influence of the constituents of cigarette smoke on changing the physicochemical properties of acrylic surfaces used in dentistry is presented and the effect of compounds present in cigarette smoke on selected properties of the tested material and its color is determined.

In order to study the influence of the substances contained in tobacco smoke, a test stand was designed and constructed. For the study, Imprimo LC Denture acrylic resin was used, from which samples were printed using a 3D printer (FREEFORM-C1F5B1(MAX UV385)) used for dental printing by Scheu-Dental Asiga MAX. Tests were then conducted to determine material properties such as microscopic observations, roughness, abrasion resistance and surface wettability. After treating the samples with selected substances found in tobacco heater cartridges, tests were again carried out to compare the properties tested. Inconclusive results were obtained, indicating the need for further testing.