

Impact of the Inclusion of Curcumin on the Surface Properties of Lyophilized Films from Poly-Lactic Acid

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Abstract

Curcumin was incorporated within the structure of lyophilized films of poly-lactic acid (PLA). Different concentrations of curcumin (10, 15 and 20 % w/v) were added to a solution of polylactic acid (2% w/v). The solutions were poured into glass dishes and lyophilized for 72 hours. An additional empty PLA film was also created through the same methodology. The obtained films were subjected to additional modification by corona discharge treatment. Time dependences of the surface potential were investigated using the vibrating electrode with compensation technique. The physical and chemical structure of the films was investigated with a Scanning Electron Microscope and Fourier-Transform Infrared Spectroscopy. The results demonstrate that introduction of curcumin at different concentrations has a noticeable impact on both electret and surface properties. The introduction of curcumin within the structure of the films can allow for the creation of biodegradable and biocompatible materials with antibacterial and antioxidant properties for a variety of applications.

Keywords

Polyphenol, lyophilization, composite film, corona charging, biopolymer.