Layer by Layer Deposition of Polyethylene Glycol Capped Silver Nanoparticles/Chitosan on Polyethylene Substrate

Multilayers of silver nanoparticles and chitosan were deposited on polyethylene film by a layer-by-layer (LBL) self-assembly technique. Silver nanoparticles with a size of about 5 nm were prepared by chemical reduction and then fabricated onto a polyethylene (PE) substrate, which led to the formation of a colored film with the thicknesses of 2, 4, 8, 12, and 20 layers. Silver nanocomposites were characterized by atomic force microscopy (AFM) and UV-visible spectroscopy, X-ray diffraction (XRD), and infrared spectroscopy (FTIR). Results showed that nanoparticles deposited homogenously on the surface of the polyethylene film. LBL silver nanocomposites showed considerable antimicrobial activity by agar diffusion test.

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