Abstract

Polylactic acid (PLA) and Hydroxyapatite (HAp) each have various applications in bone repair materials. In this paper, hydroxyapatite reinforced polylactic acid biofilms were processed through twin-screw blended cum solvent casting method. PLA/HAp films were uniformly distributed and smooth surface were obtained. The hydroxyapatites were fabricated from fish scales biowastes in a cost effective manner through chemical cum heat treatment method. The observation through energy dispersive X-ray spectroscopy confirms the presence of major element responsible for Hydroxyapatite. The surface morphology through field emission scanning electron microscope reveals the information of HAp distribution in the PLA uniformly. The particle size of the HAp was analyzed through Delsa Nano. The presence of corresponding functional group was identified by analyzing fourier transform infrared spectroscopy. The thermal stability and crystallization temperatures were analyzed by differential scanning calorimeter cum thermo gravimetric analysis. The surface wettability in order to confirm to hydrophilic nature were analyzed by using contact angle measurement. The results were concluded based upon the experiments and found that addition of HAp leads to convert the biofilms in hydrophilic in nature to make more biocompatibility. The thermal stability of the biofilms was also improved due to addition of Hydroxyapatite particles.

Keywords: Fish scales, Polylactic acid, Hydroxyapatite, Bioabsorbable, Biofilms.