Title Active packaging by extrusion processing of recyclable and biodegradable polymers

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Abstract

In this work a preliminary study on the suitability of environmentally friendly active films to be produced by melt extrusion process is presented. In particular, low density polyethylene (LDPE), polylactic acid (PLA) and polycaprolactone (PCL) were used as environmentally friendly polymeric matrices, with the former being recyclable and the latter two biodegradable. Lemon extract, thymol, and lysozyme at three different concentrations were incorporated in each polymeric matrix, respectively, to have a total of nine active films. Results suggest that processing temperatures play a major role in determining the antimicrobial efficiency of the investigated active films. In particular, antimicrobials incorporated into PLA and LDPE showed retained slight antimicrobial activity, thus having lost some activity due to higher processing temperature. On the other hand, PCL was processed at a lower temperature, which allowed less degradation of antimicrobial activity. Among the natural compounds under study lysozyme showed the higher thermal stability.