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Evaluation the Antimicrobial Activity of LDPE Nanocomposites Based on TiO_2 Nanostructure for Food Packaging Applications

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Extended Abstract

This work aims to prepare and characterize novel nanocomposite materials based on low density polyethylene (LDPE) and titanium dioxide (TiO_2) nanostructure for food packaging applications. The fabricated nanocomposites films were examined by X-ray diffraction pattern (XRD) and mechanical properties. The XRD results confirmed that the formation of LDPE nanocomposites films containing different concentrations of TiO_2 nanostructure. The mechanical properties of the prepared LDPE/TiO_2 nanocomposites were investigated. Moreover, the thermal properties of the prepared films displayed that the good enhancement of the thermal stability of the prepared film after addition of TiO_2 nanostructure. Furthermore, the permeability of oxygen transmission rate (GTR) and water vapor transmission rate (WVTR) of the prepared LDPE nanocomposites were evaluated. Moreover, the antimicrobial activity of the prepared films against gram positive (*Staphylococcus aureus*) bacteria and gram negative (*Pseudomonas aeruginosa*) bacteria were investigated.

***Keywords*:** LDPE, packaging, TiO_2 nanostructure, mechanical properties, permeability, antimicrobial activity.

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