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Polycaprolactone/Thermally Exfoliated Graphene Oxide Biocomposite Films: A Promising Moisture Absorption Behavior

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Abstract : Biocomposite materials were fabricated using mixing biodegradable polymer polycaprolactone (PCL) and Thermally Exfoliated Graphene Oxide (TEGO) through solution casting. Various samples of biocomposite films were prepared by varying the TEGO wt% composition by 0.1%, 0.5%, 1% and 1.5%. Thereafter, the density and water absorption of the composites were investigated with respect to immersion time in water. The moisture absorption results show that with an increase in weight percentage (from 0.1 to wt 1.5%) of TEGO within the biopolymer films, the absorption value of bio-nanocomposite films reduced rapidly from 27.4% to 14.3%. The density of hybrid composites also increased with increase in weight percentage of TEGO. These results indicate that the optimized composition of constituents in composite membrane could effectively reduce the anhydrous conditions of bio-composite film.

Keywords : thermally exfoliated graphene oxide, PCL, water absorption, density
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