

Eco-friendly nanocomposite films based on poly(propylene carbonate) and graphene oxide nanosheets

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Poly(propylene carbonate) (PPC) has recently been emerged as eco-friendly polymeric material due to its synthesis procedure and biodegradability. PPC has high barrier properties and good ductility, but its poor mechanical and thermal properties limit its application. In this work, we attempted the incorporation of graphene nanosheets to overcome those drawbacks of PPC. We prepared PPC/graphene nanocomposite films using functionalized graphene oxide (GO), which were synthesized by hummer's method followed by exfoliated via sonication process. The nanocomposite film with about 40 μm thickness could be obtained by 3-step subsequent procedures; solution blending, casting on the glass plate, and drying in the ambient temperature. The degree of exfoliation and dispersion in the nanocomposites with various loadings of GO were observed using XRD and TEM. We also investigated mechanical, thermal, optical, barrier properties of nanocomposite films in terms of measurement of tensile properties, glass transition temperature, visible light transmittance, and oxygen transmission rate.