

Enhancement of gas barrier and physical properties of biodegradable polypropylene carbonate using graphene nanosheets

오혁균, 김성우^{1,†}

경기대학교; ¹경기대학교 화학공학과

(wookim@kgu.ac.kr[†])

Recently, utilization of carbon dioxide has attracted scientific and practical interests due to increasing environmental concerns. Poly(propylene carbonate) (PPC) derived from carbon dioxide and propylene oxide has brought much attention for green material. However, completely amorphous PPC resin has drawbacks such as relatively poor thermal and mechanical properties, resulting in limited practical applications. Many researchers have been trying to improve physical properties of PPC through combination with inorganic nanofillers or other polymers. In this work, we obtained graphene nanosheets by using modified Hummer's method followed by sonication and microwave-assisted exfoliation processes. we prepared PPC/graphene nanocomposite films through solution blending and casting method. We explored the effect of graphene loadings and mixing time on the morphology, thermal, and mechanical properties of the nanocomposite films. The remarkable improvement in the mechanical, barrier properties was observed by small amount of graphene incorporation below 1.0wt%.