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Abstract

Nucleation Activity of Graphene in Polyamide 6-Based Nanocomposites Prepared by In Situ Polymerization †

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Graphene-based materials (GBM) are growing attention in automotive industry, due to potential of development lightweight structure parts with superior mechanical performance and thermal conductivity [1]. Polyamide 6 (PA6) nanocomposites reinforced with graphene were prepared by in situ polymerization through thermoplastic resin transfer molding (T-RTM) technology. T-RTM is a promising technology for mass manufacturing of lighter automotive parts [2].

A non-isothermal crystallization study was performed using differential scanning calorimetry (DSC) at four different rates (5, 10, 15, and 20 °C/min). Dobreva and Gutzow method [3,4] was applied to study the nucleation activity (Φ) of graphene in PA6 matrix. Results showed that graphene acted as an active surface by revealing Φ value lower than 1, suggesting that it acts as a nucleating agent during non-isothermal crystallization.

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