

عنوان مقاله:

Controlling the rheological behavior of nucleated polypropylene via incorporating dimethylbenzylidene sorbitol (DMDBS) masterbatch

محل انتشار:

دوفصلنامه پلی اولفین ها، دوره 10، شماره 1 (سال: 1402)

تعداد صفحات اصل مقاله: 6

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خلاصه مقاله:

Dimethylbenzylidene sorbitol (DMDBS) is a common nucleating/clarifier agent used in polypropylene (PP). So many researchers have looked at different aspects of incorporating this additive on crystallization behavior of PP. The current study has focused on a rather new subject and that is the role of carrier resin of DMDBS masterbatch on the rheological behaviour of polypropylene. This goal has been achieved through studying the role of carrier resin on phase separation behavior of DMDBS upon cooling. It has been shown that a permanent bonding forms between the molecules of carrier resin and DMDBS in the masterbatch and this bonding slows down the crystallization kinetics of DMDBS in the final blend which in turn, influences its rheological behavior. Frequency sweep experiments conducted on a block co-polypropylene showed that lower values of storage shear modulus (G'), loss shear modulus (G''), and complex shear viscosity (η^*) are observed if DMDBS is incorporated in the form of masterbatch. Interestingly, a different effect was observed when the masterbatch constituents were employed directly into the polypropylene, illustrating the importance of the mentioned bonding between DMDBS and the carrier resin in the masterbatch.

کلمات کلیدی:

Polypropylene, Nucleating agent, Masterbatch, Rheology, phase separation

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