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Compatibilization of LDPE/PA6 by Using a LDPE Functionalized with a Maleinized Hyperbranched Polyester Polyol

- Carlos A. Ararat[1],
- María Judith Percino[2] &
- Edwin A. Murillo[1]

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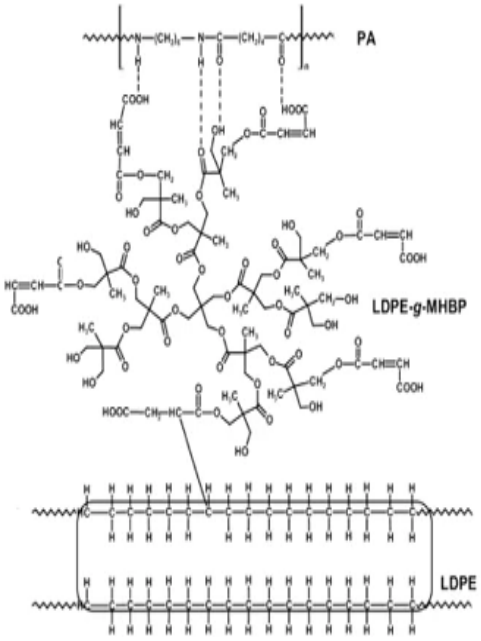
Abstract

Low density polyethylene (LDPE)/polyamide6 (PA) blends can lead to a synergy between the properties of these materials. These blends are employed mainly in the packing industry, especially in food factories. The problem of this system is that it is inmiscible, hence requires to be compatibilized. The aim of this study is to compatibilize blends of LDPE/PA6 using a LDPE modified with a maleinized hyperbranched polyol polyester (LDPE-*g*-MHBP) as a compatibilizing agent. Therefore blends of LDPE (50 wt%)/PA (50 wt%) were prepared by using proportions of 5 (Blend5), 10 (Blend10), 15 (Blend15) and 20 (Blend20) wt% of the LDPE-*g*-MHBP of the total mix. On the other hand, to determine the efficiency of the LDPE-*g*-MHBP as a compatibilizing agent, a Blend0 (blends of LDPE (50 wt%)/PA (50 wt%) without LDPE-*g*-MHBP) was used as the control sample. By infrared (IR) analysis was evidenced the interactions between PA and LDPE-*g*-MHBP. By differential scanning calorimetry analysis (DSC) was observed that the LDPE-*g*-MHBP increased the crystallinity of the LDPE phase, but the behavior was opposite to PA. The thermal stability and the viscosity of the blends obtained with LDPE-*g*-MHBP were higher than those of the Blend0. Scanning electron microscopy (SEM) analysis revealed that the LDPE-*g*-MHBP ostensibly improved the miscibility of the LDPE/PA blends.

Low density polyethylene (LDPE)/polyamide6 (PA) blends can lead to a synergy between the properties of these materials. These blends are employed mainly in the packing industry, especially in food factories. The problem of this system is that it is immiscible, hence requires to be compatibilized. The aim of this study is to compatibilize blends of LDPE/PA6 using a LDPE modified with a maleinized hyperbranched polyol polyester (LDPE-*g*-MHBP) as a compatibilizing agent.



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Author information

Affiliations

1. Grupo de Investigación en Materiales Poliméricos (GIMAPOL), Departamento de Química, Universidad Francisco de Paula Santander, Avenida Gran Colombia No. 12E-96 Barrio Colsag, Cúcuta, Colombia

   Carlos A. Ararat & Edwin A. Murillo

2. María Judith Percino, Laboratorio de Polímeros, Centro de Química, Instituto de Ciencias, Benemérita Universidad Autónoma de Puebla (BUAP), Complejo de Ciencias, ICUAP, Edif. 103H, 22 Sur y San Claudio, C.P. 72570, Puebla, México

María Judith Percino

Authors

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2. María Judith Percino
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3. Edwin A. Murillo
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Corresponding author

Correspondence to Edwin A. Murillo.

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