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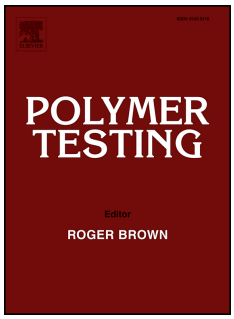

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Poly(butylene succinate)-cellulose triacetate blends: permeation, pervaporation, sorption and physical structure

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Abstract

We report on the characterization of blends of polybutylene succinate (PBS) with cellulose triacetate (CTA) with focus on their mass transport properties and physical structure. Blends containing 0–30 wt.% of PBS were tested using gas permeation, vapour permeation, pervaporation and vapour sorption. Permeability for gases (CO_2, H_2, etc.) decreased with increasing PBS content in a fixed ratio. In contrast to that, permeability for vapours (methanol, dimethyl carbonate) decreased compound-specifically, thus rendering the blends more selective towards methanol than pure CTA. Interestingly, higher separation factors were observed for the permeation of vapours than for the pervaporation of liquids. The influence of the PBS content on the physical structure and thermal properties of the blends were studied using XRD, SEM, FTIR-ATR, DSC, TGA and DMA techniques. Overall, the blends of PBS and CTA were homogenous, thermally stable and had enhanced barrier properties compared to pure CTA.

Keywords: PBS CTA blends; barrier properties; glass transition; physical properties; pervaporation and permeation

1 Introduction

Cellulose triacetate (CTA) has been frequently used as a basic material for numerous applications in packaging, coating and production of separation membranes [1-9]. Recently, Uesaka et. al [10] reported that polybutylene succinate (PBS) forms homogenous blends with CTA. The authors observed that crystallization of PBS is completely hindered in blends con-

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