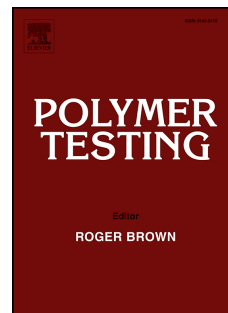


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Tough and transparent blends of polylactide with block copolymers of ethylene glycol and propylene glycol

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ABSTRACT. In order to modify its physical properties, particularly the drawability and toughness, polylactide (PLA) was melt blended with a set of PEG-b-PPG-b-PEG block copolymers with varying ratio of the hydrophilic (PEG) and hydrophobic (PPG) blocks. Miscibility of the copolymers with PLA depended on their molar mass and PEG content. Interestingly, the best drawability was achieved in the case of partially miscible blends, in which fine liquid inclusions of the modifier were dispersed in PLA rich matrix with glass transition temperature only moderately decreased, to about 50 °C. About 37 fold increase of the elongation at break and about 1.5 fold increase of the tensile impact strength with respect to neat PLA were reached at small content (10 wt.%) of the modifier. Despite the phase separation, the blends remained transparent. In addition, the barrier properties for oxygen were improved.

Key words: polylactide, toughening, drawability, mechanical properties, optical properties, barrier properties.

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