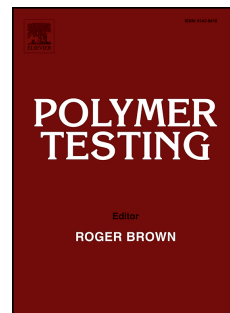


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Chromatography Strategies for the Composition Determination of Bio-based Sorbitol Azelaic Acid Ester

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Abstract

Bio-based sorbitol azelaic acid ester (SAAE) is an alternative to the fossil fuel derived polyester polyol for polyurethane production. The quality of SAAE is affected by the composition of sorbitol (SL) and its anhydrides azelate. Unavailability of the standard of these esters renders the composition analysis difficult. The sole method to quantify the SAAE composition is by gauging the conversion of the azelaic acid (AA), SL and its anhydrides during the esterification reaction. The present work evaluated the chromatography techniques for the SAAE composition analysis during the esterification of SL and AA. In comparison to other methods that yielded distorted peaks, gas chromatography analysis of samples derivatised using Silylation II with steady heating and reduced carrier gas flow rate outperformed others, producing identical and sharp peak shape for AA, SL and its anhydrides. The presence of SL and its anhydrides in the sample was also affirmed using Nuclear Magnetic Resonance.

Keywords

Biobased polyester polyol, chromatography, azelaic acid, sorbitol

1. Introduction

Polyurethane (PU) is a class of polymer which has widespread usage in automotive, medical and industrial sectors. The global polyurethanes market is poised to surge at CAGR of around 7.5%, anticipating to reach USD 77.0 billion by 2020 [1] due to its remarkable versa-

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