Polyester Polyol Analysis on Agilent PLgel MIXED-E with Gel Permeation Chromatography

Application Note

Materials Testing and Research, Polymers

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Introduction

Polyols are alcohols containing multiple hydroxyl groups. Their main use is as reactants to make other polymers such as polyester polyol. This is formed by condensation or step-growth polymerization of a diol polyol with dicarboxylic acid. Polyester polyols are reacted with polyisocyanates in the manufacture of polyurethanes for rigid-foam, flame-retardant building board. Natural oil polyester polyols from vegetable oils are beginning to replace some epoxide-based polyols.

Analysis of polyester polyols is straightforward with gel permeation chromatography using Agilent PLgel 3 µm MIXED-E columns. These columns are ideal for low molecular weight samples that contain oligomeric fractions, as well as polymers, up to 30,000 MW.

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Analysis of a polyester polyol

This separation (Figure 1) demonstrates the excellent resolution of the oligomeric species in a polyol sample prepared from adipic acid and butandiol using Agilent PLgel 3 µm MIXED-E columns.

Conditions

Column	2 × Agilent PLgel 3 µm MIXED-E, 300 × 7.5 mm (p/n PL1110-6300)
Eluent	THF
Flow rate	1.0 mL/min
Detector	RI
System	Agilent PL-GPC 50

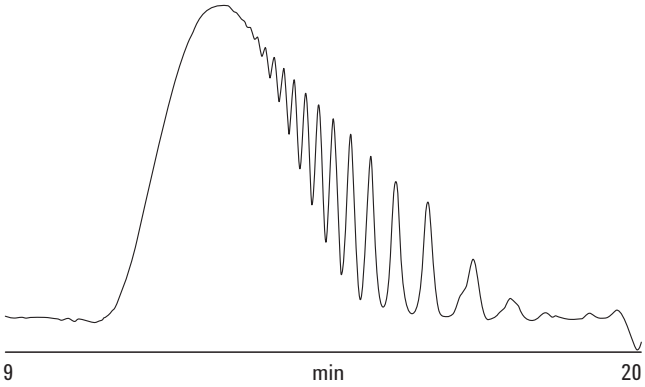

Figure 1. Separating oligomers in a polyester polyol on an Agilent PLgel 3 µm MIXED-E two-column set.

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