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

Application Note

Materials Testing and Research, Polymers

Authors

Greg Saunders and Ben MacCreath

Agilent Technologies, Inc.

Essex Road

Church Stretton

S46 6AX

UK

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.

Agilent Technologies

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

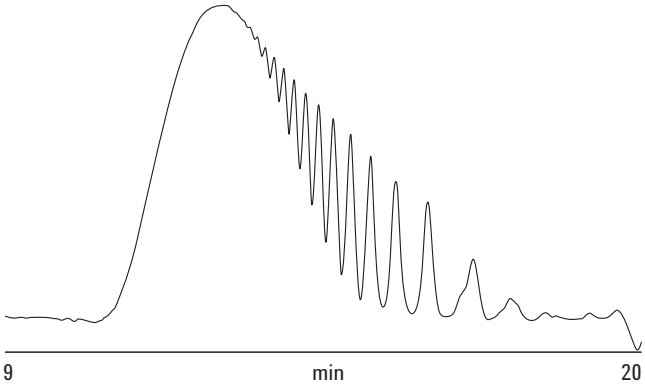

Figure 1. Separating oligomers in a polyester polyol on an Agilent PLgel 3 µm MIXED-E two-column set.

For More Information

For more information on our products and services, visit our Web site at www.agilent.com/chem.

www.agilent.com/chem

Printed in the USA
April 21, 2011
5990-7986EN

Agilent Technologies