

Adipate Polyester Analysis on Agilent PLgel 3 µm MIXED-E by Gel Permeation Chromatography

Application Note

Materials Testing and Research

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Introduction

Polyesters are produced from the condensation of a diacid with a dialcohol, eliminating water in the process. Depending on the acid and alcohol used, polyester can have a wide range of properties including flexibility or hardness, stability to hydrolytic degradation and solvent, and abrasion and shock resistance. All these properties are useful for a wide range of applications.

Adipate esters are produced by the condensation of a dialcohol with adipic acid. Saturated adipate polyesters are used as cast elastomers; depending on the dialcohol used in the synthesis, linear or branched polyesters may be obtained. These polyesters are reacted with isocyanates to produce prepolymers with residual NCO groups that are precursors to mixed polyurethanes, a very important commercial class of material.

In this case, gel permeation chromatography (GPC) with Agilent PLgel 3 μ m MIXED-E columns is used to investigate two adipate polyester samples.

Adipate Polyester Analysis

Figure 1 shows the analysis of two adipate polyester materials. The high resolution MIXED columns resolve the polymers into individual oligomers, giving a characteristic peak shape that can be used to identify and fingerprint different batches of polymer.





Conditions

Columns $2 \times Agilent PLgel 3 \mu m MIXED-E, 7.5 \times 300 mm$

(p/n PL1110-6300)

Eluent THF (stabilized)

Flow rate 1.0 mL/min

Inj vol 20 μL

Detector RI

System Agilent PL-GPC 50

Conclusions

Low pore size, high resolution Agilent PLgel 3 μm MIXED-E columns can be used to fingerprint the oligomeric distribution of resins such as adipate polyester.

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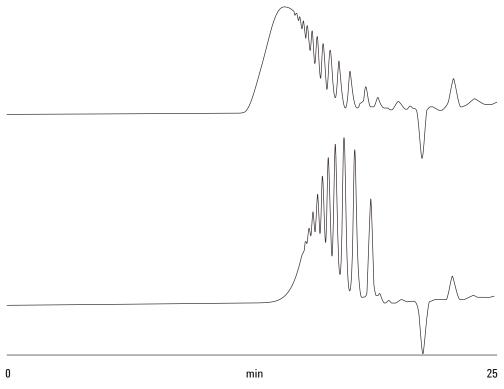


Figure 1. Using gel permeation chromatography with an Agilent GPC system to fingerprint adipate polyesters.

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