Fractionation of Formaldehyde Resin on Agilent PLgel by Gel Permeation Chromatography

Application Note

Materials Testing and Research

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Introduction

Resolving closely eluting fractions in highly disproportionate concentrations is achieved by using a heart-cutting technique. The same technique can also be used to avoid cross-fraction contamination by removing the sample matrix.
In this example, heart-cutting was employed in an identification of fractions of a phenanthrene-formaldehyde resin. The resin fractions were separated by gel permeation chromatography with Agilent PLgel 10 µm 500Å columns.

Fractionation of Phenanthrene-Formaldehyde Resin

Figure 1 shows the phenanthrene-formaldehyde resin monomer, dimer and trimer fractions. After separation of the fractions (Figure 2), identification was done using mass spectroscopy and infra-red spectroscopy.

Conditions

Column	Agilent PLgel 10 µm 500Å, 25 × 300 mm (p/n PL1210-6125)
Eluent	Dichloromethane
Flow rate	9.0 mL/min
Conc	10%
Inj vol	2 mL
Detector	RI
System	Agilent PL-GPC 50

Verified for Agilent
1260 Infinity
GPC/SEC System

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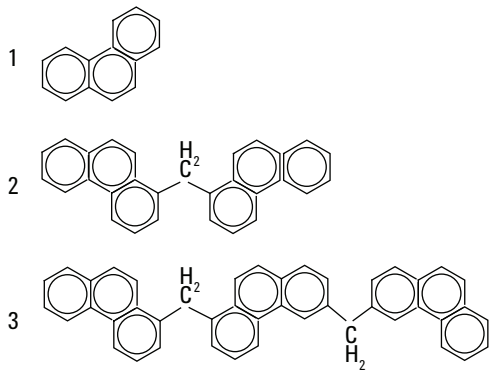

Figure 1. Structure of three fractions of a phenanthrene-formaldehyde resin.

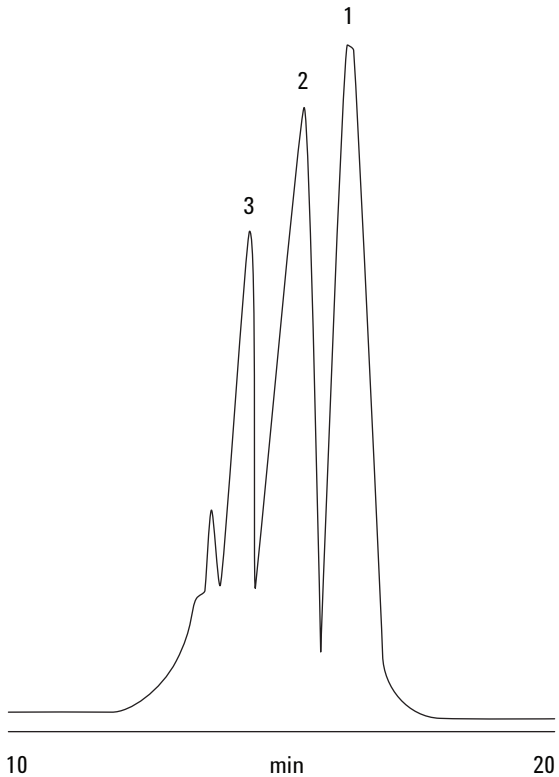

Figure 2. Separation of three fractions of phenanthrene-formaldehyde on Agilent PLgel 10 µm columns.

Conclusions

Preparative gel permeation chromatography employing a heart-cut technique can be used to separate and isolate components of a polymer on the basis of size in solution.

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Printed in the USA
April 30, 2015
5990-8603EN

Agilent Technologies