Melamine Resin Analysis with Agilent PLgel Columns and Gel Permeation Chromatography

Application Note

Materials Testing and Research

Author

Graham Cleaver

Agilent Technologies, Inc.

Introduction

Melamine is an organic base produced by heating urea to give cyanic acid, which then polymerizes to form melamine. It contains 66% nitrogen by weight and, if further polymerized with formaldehyde resins, acquires fire retardant properties because it releases nitrogen gas when burned. As a hard, thermosetting resin it has had many uses, such as tableware, laminated boards for kitchen cabinets and worktops, in laminate flooring and for furniture.

Melamine Resin Analysis

The chromatogram in Figure 1 shows a low molecular weight melamine resin with good resolution of individual oligomeric components. Dimethylformamide (DMF) is a polar solvent and therefore suitable for the analysis of polar resins such as these. Elevated temperature is recommended to reduce the eluent viscosity.

Agilent Technologies

Conditions

Column	2 × Agilent PLgel 5 µm 100Å, 7.5 × 300 mm (p/n PL1110-6520)
Eluent	DMF
Flow rate	1.0 mL/min
Temp	80 °C
System	Agilent 1260 Infinity GPC/SEC Analysis System
Detector	RI

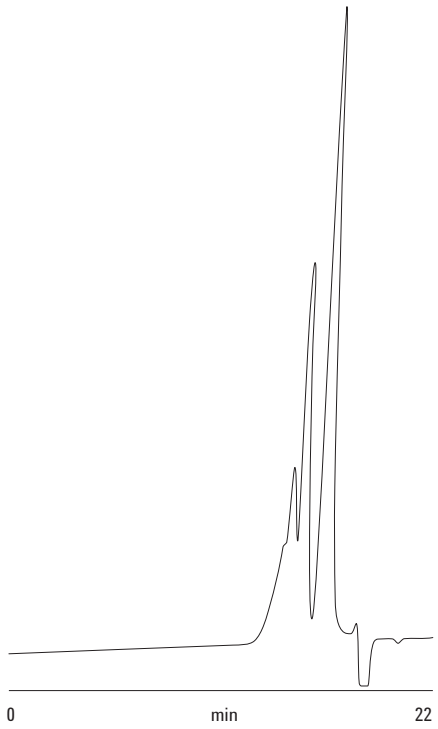

Figure 1. Oligomeric composition of a melamine resin revealed by gel permeation chromatography using an Agilent PLgel 5 µm two-column set.

Conclusion

Gel permeation chromatography using high resolution Agilent PLgel columns allows complex materials such as melamine resins to be analyzed in great detail.

For More Information

These data represent typical results. 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 30, 2015
5990-8419EN

Agilent Technologies