

# Epoxy Resin Analysis with Agilent OligoPore Columns and Gel Permeation Chromatography

## Application Note

Materials Testing and Research

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### Introduction

Epoxy resin prepolymers consist of oligomeric and polymeric diepoxides that are cured to form the finished product by the addition of a fixing or hardening agent. The formulation of the prepolymer is vital to controlling the physical properties of the final product. High resolution gel permeation chromatography (GPC) can be used to investigate the oligomeric distributions of epoxy resin prepolymers for formulation and quality control. This application note outlines the analysis of two grades of epoxy resin using Agilent OligoPore columns. Epoxy resins contain strong chromophores therefore, UV detection can be employed.

### Epoxy Resin Oligomer Analysis

Figure 1 shows chromatograms of two epoxy resin samples. The first resin contains some high molecular weight material that is excluded on the Agilent OligoPore columns. However, the oligomeric distribution can be seen. The second resin contains no material with a molecular weight greater than about 5,000 g/mol, the exclusion limit of the column. A number of oligomers are resolved. Although the presence of some peaks, with similar retention times, indicates that there are some oligomers common to both samples, the oligomer distributions of the two resins are clearly very different.



## Conditions

Columns	2 × Agilent OligoPore, 7.5 × 300 mm (p/n PL1113-6520)
Eluent	THF + 250 ppm BHT
Flow rate	1.0 mL/min
Inj vol	100 µL
Detector	UV, 254 nm
System	Agilent PL-GPC 50

## Conclusions

The relative oligomeric content of two grades of epoxy resin can be compared by high resolution gel permeation chromatography using Agilent OligoPore columns.

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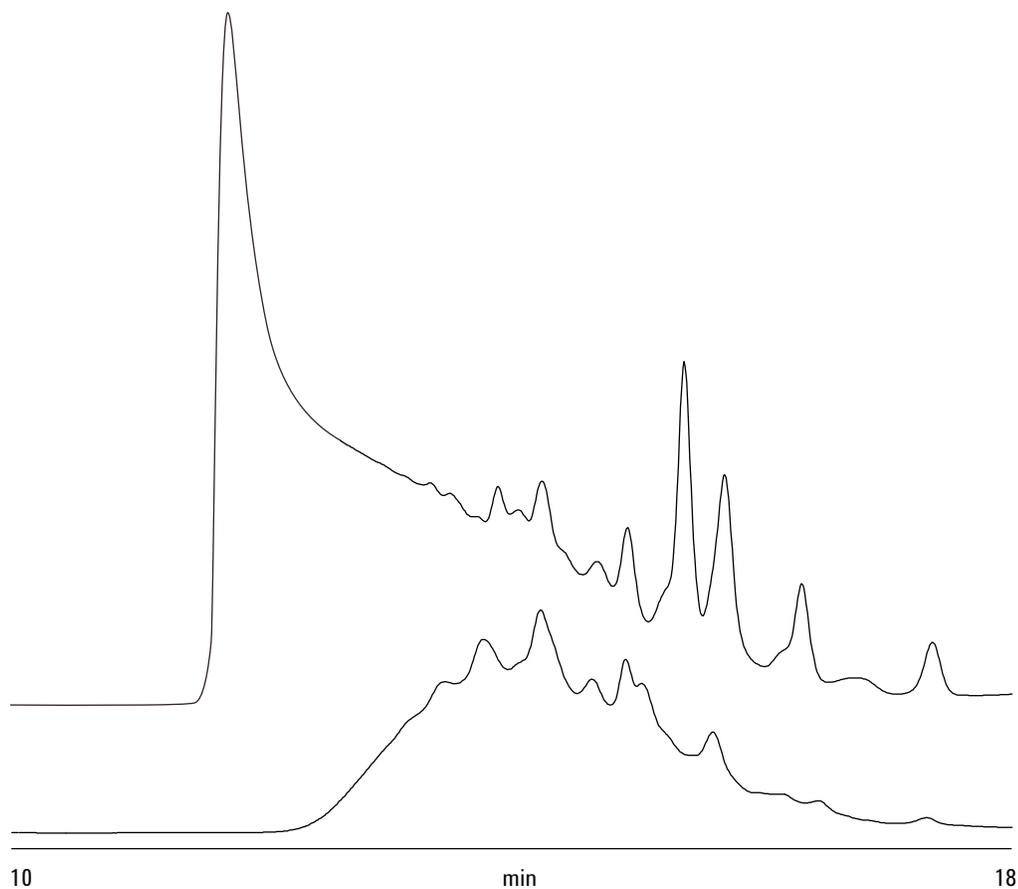


Figure 1. Analysis of two epoxy resins on Agilent OligoPore columns reveals very different oligomer distributions despite the presence of some oligomers common to both samples.

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