Effect of Molecular Weight on Sample Loading in Gel Permeation Chromatography

Technical Overview

Introduction

In gel permeation chromatography and size exclusion chromatography, sample loading is very dependent on the molecular weight distribution of the polymer. Broader distribution polymers can be loaded to a greater extent. This effect is demonstrated on an Agilent PLgel 10 µm MIXED-B column. Figure 1 shows the column calibration using Agilent EasiCal polystyrene calibrants. Figure 2 shows the effect of sample loading on the molecular weight distribution of a polystyrene with Mw = 250,000 and dispersity = 2.5.

Conditions

Calibrants	EasiCal (0.1% solution, 200 µL injection)
Column	Agilent PLgel 10 µm MIXED-B, 25 × 300 mm (p/n PL1210-6100)
Eluent	THF
Flow rate	10 mL/min
Detector	RI
System	Agilent PL-GPC 50

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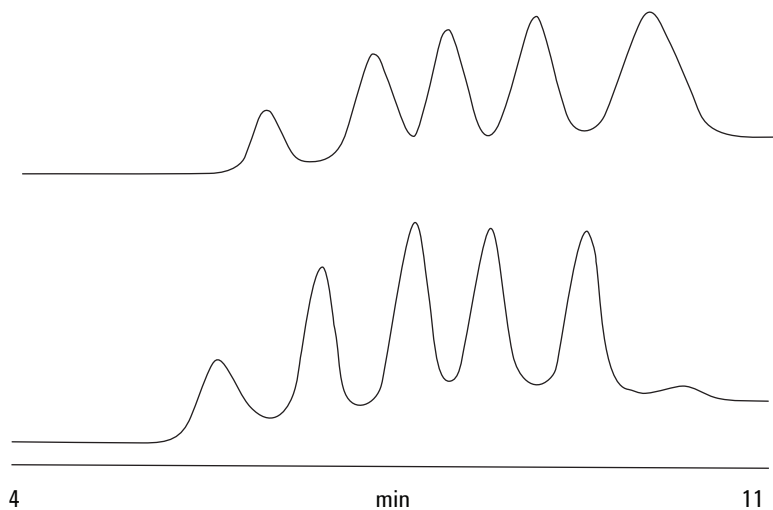| Mp (upper trace) | 3,040,000 | Mp (lower trace) | 8,500,000 |
	330,000		1,030,000
	66,000		156,000
	9,200		28,500
	580		3,250

4   min   11

Figure 1.   Calibration of an Agilent PLgel 10 µm MIXED-B column with Agilent EasiCal polystyrene standards.

0.25%
2000 µL

0.5%
2000 µL

1.0%
2000 µL

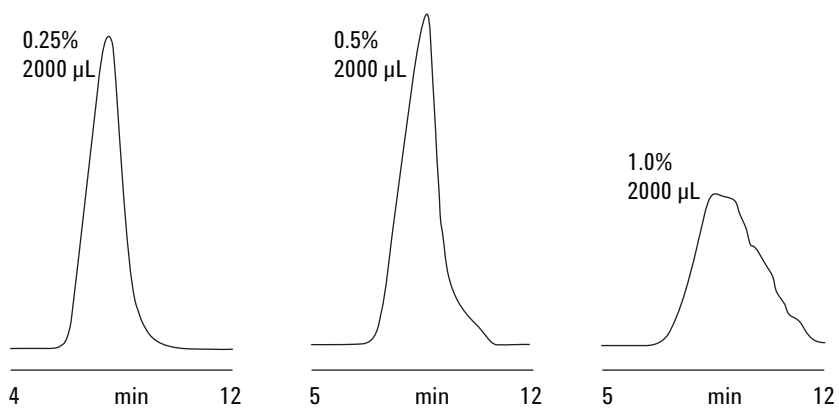4   min   12   5   min   12   5   min   12

Figure 2.   Effect of polystyrene molecular weight on sample loading demonstrated on an Agilent PLgel 10 µm MIXED-B column.

GPC/SEC columns and calibrants from Agilent

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