Agilent PL-SP 260VS Sample Preparation System for Manual Dissolution and Filtration

Data Sheet

Introduction

The Agilent PL-SP 260VS Sample Preparation System is designed for manual dissolution and filtration of samples prior to GPC analysis. The system combines controlled heating from 30 – 260 °C with gentle agitation from 85–230 rpm, making it ideal for a broad range of polymer types.

Key Benefits

- **Choice of vial types**–The removable aluminium blocks for the heated compartment are available in several formats to accommodate a variety of vial types
- **Efficient dispensing**–A unique pipettor device efficiently dispenses hot filtered sample solution from the sample preparation vial directly into destination (autosampler) vials, with minimal handling
- **Choice of filtration media**–Choose from either glass fiber or porous stainless steel
- **Variable speed**–During sample preparation, the vials can be agitated continuously, or the shaker can be programmed to operate for specific periods of time

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System Details

The Agilent PL-SP 260VS Sample Preparation System allows the dissolution and filtration of samples across a temperature range of 30–260 °C (± 2 °C). With the heater/shaker unit, samples are dissolved at controlled temperatures with gentle agitation, user selectable from 85–230 rpm (± 10%), to avoid shear degradation of the polymers. Filtration is achieved using a unique hand-held pipettor with a selection of filter magazines containing either stainless steel frits, in pore sizes of nominally 0.5 to 10 µm, or glass fiber filters at a nominal 1 µm porosity. The 1 µm glass fiber filter magazine is particularly suited to the removal of fine, insoluble particulates such as carbon black, as its double layer acts as a 'depth filter' fit for use with even high molecular weight polymers. Figure 1 shows a successfully filtered solution of polyethylene containing carbon black.

However, during filtration, it is important that no high molecular weight fractions of the sample are retained on the filter as this would result in errors in concentration and distortion of the molecular weight distribution.

To demonstrate the ability of the system to handle such conditions, a series of polymer solutions, also from Agilent, were prepared in THF.

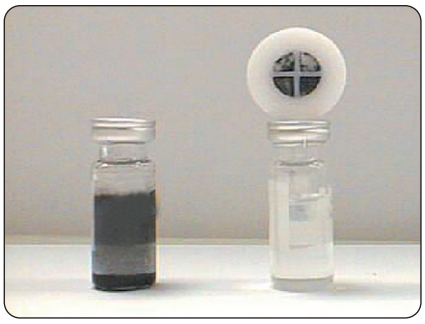

Figure 1.
A successfully filtered solution of polyethylene containing carbon black using a 1 µm glass fiber filter magazine.

The solutions were analyzed by GPC in THF before and after filtration using the 1 µm glass fiber filters to determine if any loss of the high molecular weight material occurred. Polystyrene standards were prepared, each containing polystyrene Mp 126,000 at 0.5 mg/mL and either polystyrene narrow standard Mp 3,900,000, Mp 7,100,000 or Mp 11,600,000 at 0.1 mg/mL.

Conditions

Column	Agilent PLgel MIXED-B, 300 mm × 7.5 mm, 10 µm (part number PL1110-6100)
Samples	Polystyrenes
Eluent	THF (stabilized)
Flow rate	1.0 mL/min
Injection volume	200 µL
Detection	UV, 254 nm

Figure 2 shows an example overlay of chromatograms of the Mp 126,000 and Mp 3,900,000 standards before and after filtration. It can be seen that, after filtration, none of the high molecular weight material was removed from the sample. In addition, the retention times of the high molecular weight standards were unchanged. These data clearly demonstrate the suitability of the filters for even high molecular weight polymers.

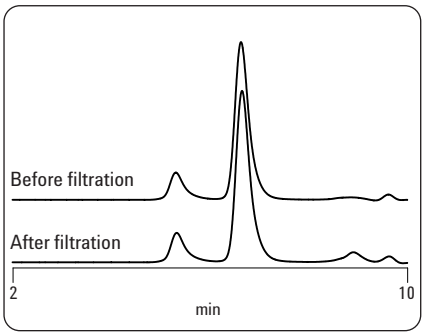

Figure 2.
Overlay of chromatograms of the Mp 126,000 and Mp 3,900,000 standards before and after filtration.

Ordering Information

Agilent PL-SP 260VS Sample Preparation System	
Part Number	**Description**
PL0810-4050-110	PL-SP 260VS Sample Preparation System-110 V
PL0810-4050-220	PL-SP 260VS Sample Preparation System-220 V
PL0810-4100	PL-SP 260VS Standard Accessory Kit
PL0810-4006	Filter magazines, 1 µm glass fiber (pack of 50)
PL0810-4003	Filter magazines, 0.5 µm stainless steel (pack of 50)
PL0810-4002	Filter magazines, 2 µm stainless steel (pack of 50)
PL0810-4004	Filter magazines, 5 µm stainless steel (pack of 50)
PL0810-4005	Filter magazines, 10 µm stainless steel (pack of 50)

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