SEC Analysis of Modified Hydroxyethyl Cellulose

Application Note

Authors

Greg Saunders, Ben MacCreath
Agilent Technologies, Inc.

Introduction

Hydroxyethyl cellulose (HEC) is widely used by the cosmetic, paint, textile and pharmaceutical industries, for example, as a carrier gel for microbiocides. It is a non-ionic polymer with many useful properties as a thickening agent, stabilizer, emulsifier or dipersant, and it easily dissolves in hot and cold water. In addition, the water repellant properties of HEC can be improved to enhance its value to the manufacturers of waterproof textiles.

Modifying the hydrophobicity alters the molecular weight, and such changes can be assessed by size exclusion chromatography (SEC) with Agilent PL aquagel-OH 40 and 60 8 µm columns.

These columns are ideal for the analysis of HEC, because they combine low exclusion limit, high pore volume and high column efficiency (>35,000 plates/meter) for maximum resolution. In this case, two different PL aquagel-OH columns were connected in series to cover a molecular weight range from 10^4 to 10^7. Column calibration was achieved using pullulan standards.

Agilent Technologies

Conditions

Samples:	Hydroxyethyl cellulose before and after modification
Columns:	2 x PL aquagel-OH 60 8 µm, 300 x 7.5 mm (p/n PL1149-6860) + 1 x PL aquagel-OH 40 8 µm, 300 x 7.5 mm (p/n PL-1149-6840)
Eluent:	0.05 M NaH_2PO_4 + 0.25 M NaCl at pH 7
Flow Rate:	1.0 mL/min
Detection:	RI

Results and Discussion

Figure 1 shows overlaid molecular weight distributions of a sample of HEC before and after modification to its hydrophobicity. Sample A is HEC. Sample B is Sample A after hydrophobic modification.

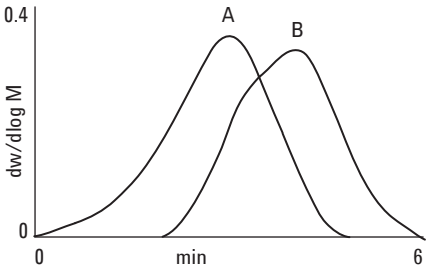

Figure 1. Overlaid MW distributions of a sample of HEC before and after modification

Conclusion

SEC using PL aquagel-OH columns successfully resolved a sample of hydroxyethyl cellulose before and after hydrophobic modification. The 'neutral' surface and capability of operating across a wide range of eluent conditions equip PL aquagel-OH for the high performance analysis of analytes with neutral, ionic and hydrophobic moieties, singly or combined.

www.agilent.com/chem

Published in UK, September 2, 2010
SI-01635

Agilent Technologies