



SEC Analysis of Carboxymethyl Cellulose

Application Note

Author

Graham Cleaver
Agilent Technologies, Inc.

Introduction

Size exclusion chromatography (SEC) can be used to reveal slight differences in the molecular size profiles of water soluble polymers that are within the same viscosity grade.

Polymers, such as carboxymethyl cellulose (CMC), may have different physical characteristics due to the variation in the molecular weight of the material. CMC is widely used in the food industry for controlling viscosity and thickening, and to increase volumes of baked products by enhancing production of gas bubbles.

Agilent PL aquagel-OH 40 and 60 8 μm columns are ideal for distinguishing fine variations in CMC molecular weights, 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 versions of PL aquagel-OH were connected in series to cover a molecular weight range from 10^4 to 10^7 . Column calibration was achieved using pullulan standards.



Conditions

Samples: Carboxymethyl celluloses
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 PL1149-6840)
Eluent: 0.5 M Na_2SO_4
Flow Rate: 1.0 mL/min
Detection: RI

Results and Discussion

Figure 1 shows the slight differences in molecular weights of three carboxymethyl celluloses that lie within the same viscosity range.

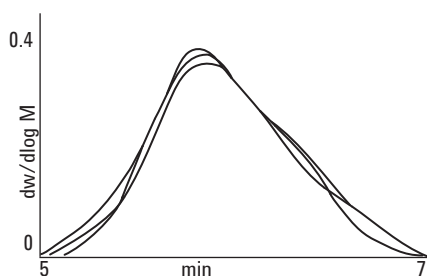


Figure 1. Raw data chromatograms showing slight differences in the MWs of three carboxymethyl celluloses lying within the same viscosity range

Conclusion

SEC and PL aquagel-OH columns successfully resolved samples of carboxymethyl cellulose and revealed slight differences in their molecular weights, despite their having similar viscosities. 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.

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