

# SEC Analysis of Polyvinyl Pyrrolidone

## Application Note

### Author

Graham Cleaver  
Agilent Technologies, Inc.

### Introduction

PVP (polyvinyl pyrrolidone, povidone, polyvidone) is a water-soluble polymer made from N-vinyl pyrrolidone monomer. PVP is soluble in aqueous solvents and polar organics. It has excellent wetting properties and readily forms films, and so it performs well as a coating or coating additive. PVP binds to polar molecules exceptionally easily, owing to its polarity. This has led to applications in coatings for tablets and photo-quality ink-jet paper and transparencies, as well ink-jet inks. In addition, PVP has uses in personal care products, contact lens solutions, hair sprays and gels. Industrial applications include paints, wettable adhesives and food additives. A sample of PVP was analyzed using Agilent PL aquagel-OH 50 and 60 8  $\mu\text{m}$  columns. These columns are ideal for characterizing PVP because they combine high pore volume and high column efficiency ( $>35,000$  plates/meter) for maximum resolution. In this instance, they were employed in a column set, covering a molecular weight range from about  $5 \times 10^5$  to  $10^7$ .



## Results and Discussion

The chromatogram reveals that the PVP sample has a broad distribution.

### Conditions

Sample: Polyvinyl pyrrolidone  
Columns: 1 x PL aquagel-OH 60 8  $\mu\text{m}$ , 300 x 7.5 mm (p/n PL1149-6860)  
+ 2 x PL aquagel-OH 50 8  $\mu\text{m}$ , 300 x 7.5 mm (p/n PL1149-6850)  
Eluent: 0.2 M  $\text{NaNO}_3$  + 0.01 M  $\text{NaH}_2\text{PO}_4$  at pH 3  
Flow Rate: 1.0 mL/min  
Detection: RI

## Conclusion

SEC using PL aquagel-OH columns successfully analyzed a sample of polyvinyl pyrrolidone. Aqueous SEC with PL aquagel-OH columns provides information not only on the molecular weight of the polymer but also on the polydispersity and the shape of the molecular weight distribution. The excellent chemical and mechanical stability of these columns offer high performance with good repeatability and column lifetime.

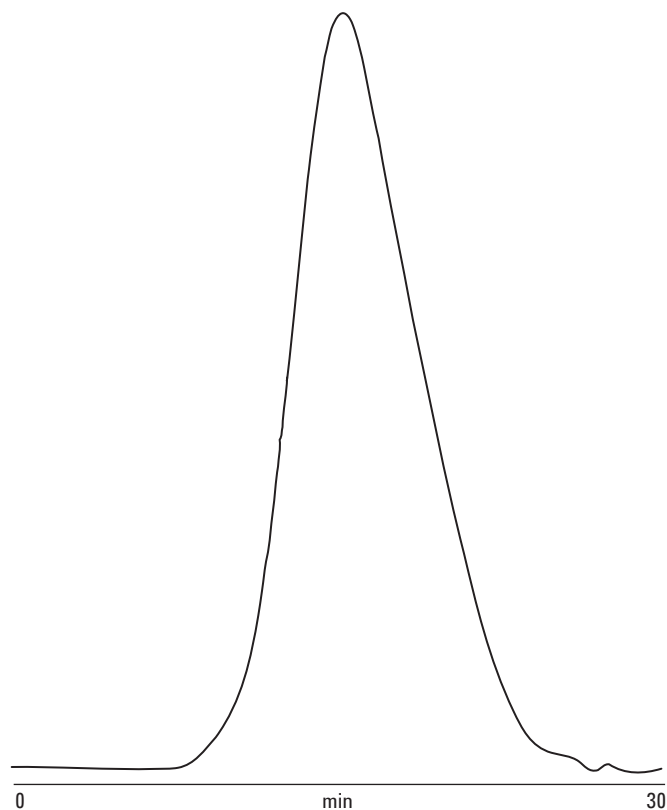


Figure 1. Raw data chromatogram of polyvinyl pyrrolidone

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