



# SEC Analysis of Sodium Polyacrylate

## Application Note

### Author

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### Introduction

Sodium polyacrylate ( $-\text{CH}_2-\text{CH}(\text{COONa})_n$ ) is an acrylic acid polymer sodium salt. The value of this polymer lies in its ability to absorb up to 1,000 times its weight in distilled water, giving it a high gel capacity. Such polymers are referred to as 'super absorbents' or 'water crystals'. Unsurprisingly, sodium polyacrylate finds applications that make use of its superabsorbency, such as diapers and incontinence pads, and in agriculture for spray drift control, seed germination, soil conditioning, hydroponics and as a water storage agent for soils, where it soaks up soil moisture and releases it when the soil dries out. It is also used by many industries as a thickener and stabilizer. SEC using Agilent PL aquagel-OH columns is an excellent system for characterizing this polymer. The columns combine high pore volume and high column efficiency (>35,000 plates/meter) for maximum resolution.



## Conditions

Samples: Sodium polyacrylate  
Columns: 2 x PL aquagel-OH 40 8  $\mu\text{m}$ , 300 x 7.5 mm (p/n PL1149-6840)  
Eluent: 0.2 M  $\text{NaNO}_3$  + 0.01 M  $\text{NaH}_2\text{PO}_4$  at pH 7  
Flow Rate: 1.0 mL/min  
Detection: RI

## Results and Discussion

The chromatogram shows a relatively low molecular weight sample with Mw approximately 13,000. The sample was readily soluble and the salt/buffer eluent was selected to minimize ionic effects.

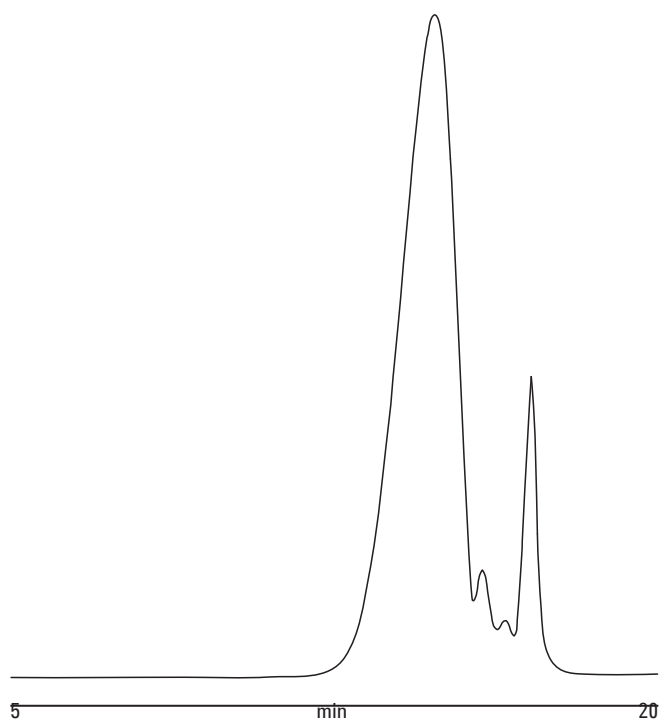


Figure 1. Raw data chromatogram of sodium polyacrylate

## Conclusion

SEC using PL aquagel-OH columns successfully analyzed a sample of sodium polyacrylate. 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.

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