

Molecular weight characterization of polyacrylamides

Application

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The analyzed polyacrylamides are used for drag reduction effects of ships and submarines. They are sprayed onto the ship's surface and reduce drag and therefore noise and fuel consumption. A further application of polyacrylamides is in water clarification purposes as setting aids. The polymer acts as flocculants to help remove contaminants from the water stream. All three polyacrylamides have a very high weight average molecular weight M_w . The GPC-SEC method

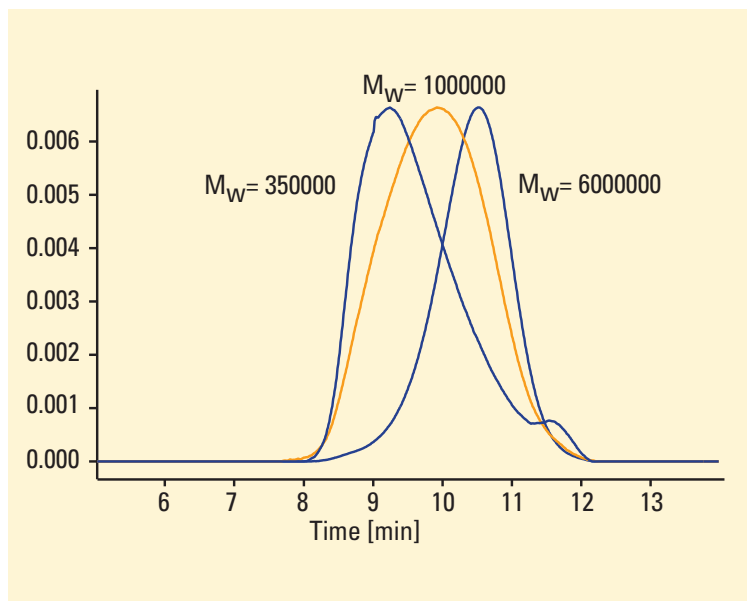


Figure 1
Overlay of high molecular weight polyacrylamides chromatograms

Conditions

Sample preparation

Sample was dissolved in mobile phase (concentration 0.1 %).

Column

PSS Suprema 10⁴, 8 x 300 mm, 10 µm

Mobile phase

0.3 M NaNO₃

Flow rate

0.5 mL/min

Column compartment temperature

25 ° C

Injection volume

100 µL

Detector

Refractive index detector

Polymer standards

PSS broad polyacrylamide standards



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presented here shows an easy but reliable and precise analysis for the molecular weight characterization of polyacrylamides. Besides the weight average molecular weight M_w the ChemStation GPC-SEC data analysis software calculates data as M_n , M_z , M_p , M_v , polydispersity D , differential and integral molecular weight distribution. The software allows internal standard and detector delay corrections, and includes narrow, broad, universal and integral calibration.

HPLC performance

RSD of M_w	< 2%
RSD of M_n	< 5%

Equipment

Agilent 1100 Series GPC-SEC system

consisting of

- vacuum degasser for efficient degassing of the mobile phase
- isocratic pump with large solvent cabinet
- autosampler with single valve design
- thermostatted column compartment for precise column temperatures
- refractive index detector with automatic recycle valve
- ChemStation Plus with GPC-SEC data analysis software

Columns supplier:
Polymer Standards Service,
Mainz, Germany

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