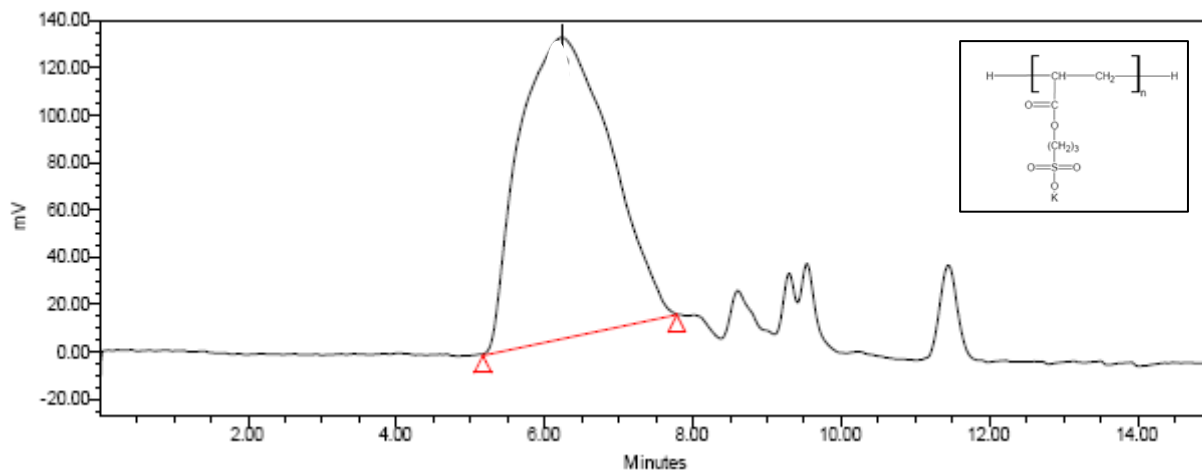


No. AO-04 B#1

# Certificate of Analysis

Product Name: Poly(Sulfopropyl acrylate) (Viscosity 58.91 cP 1% in water at 60RPM)

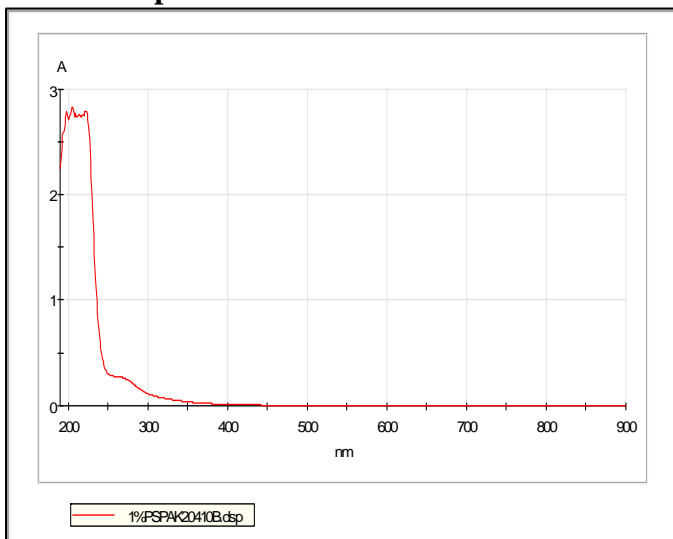
- GPC analysis of PSPAK polymer



Analysis Method (as provided by supplier): Agilent 1050 Series with 1 ml/min 0.1N sodium nitrate in HPLC water flow across PL aquagel Mixed-OH columns. Detection via Differential Refractive Index (128x, 40°C), calibrated against EasiVial<sup>®</sup> polyethylene glycol/oxide standards.

Polymer	Mn (from GPC)	Mw (from GPC)	PDI
PSPAK	226281	472555	2.088

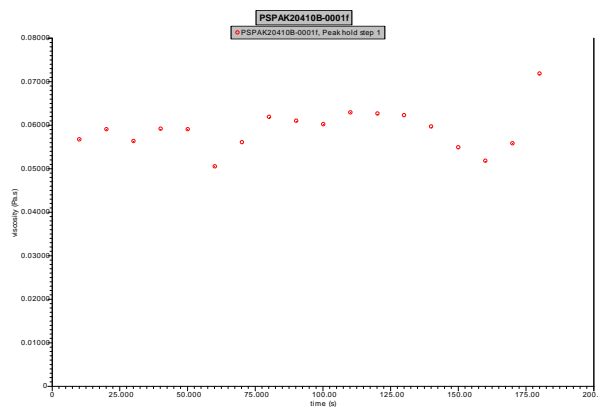
## UV-Vis Spectrum



Analysis Method: 1% solution in distilled water measured on Genesis-6 against a distilled water blank. Spectrum recorded at 1nm resolution from 900-190nm wavelength using visionlite software.

## Viscosity

Polymer	Viscosity (cP)
Poly(SPAK)	<b>58.91</b>



Analysis Method: 1% solution in distilled water placed in AR550 rheometer with 2° 60mm plate temperature held at 25C rotated at 60RPM 6 measurements made every 10 seconds over the course of 1 minute.