

SEC of Homopolymer:

P291-SSO₃Na

Sample Name:

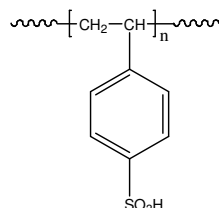
**Poly(styrene sulfonic acid sodium salt),
Dialysed)**

In dialysed form or undialysed form

Sample #: **P291-USSO₃Na**

Undialysed form

Structure:

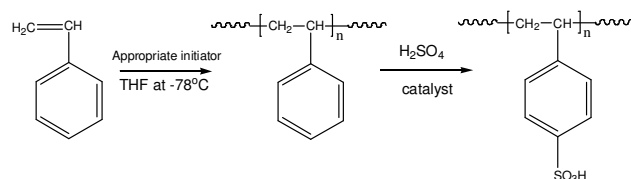


Composition:

$M_n \times 10^3$	PDI
509.0	1.15
Degree of sulfonation	82.2%

Synthesis Procedure:

Poly(styrene sulfonic acid) is obtained from the sulfonation of polystyrene. Polystyrene was obtained by anionic living polymerization. The molecular distribution of the obtained polystyrene sulfonic acid remains same as of the parent polymer. Furthermore the HNMR and FTIR spectroscopy of the polymer shows the sulfonation is predominately at par position of phenyl group. The reaction scheme is illustrated below:



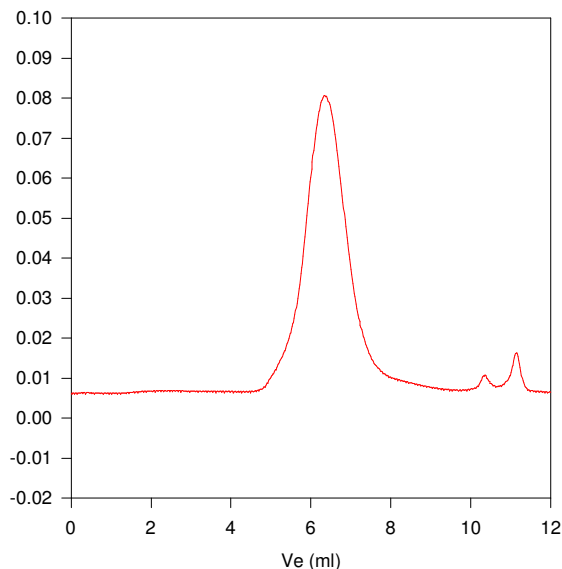
Characterization:

Size exclusion chromatography (SEC) was carried out on a Varian liquid chromatograph equipped with a refractive detector. For the precursor polystyrene, two columns from Supelco (G4000-2000 HXL) were used with THF as the eluent. The columns were calibrated with monodisperse polystyrene standards. The molecular weight and the polydispersity indices were calculated. For polystyrene sulfonic acid, a column from Supelco (G5000 PWXL) was used with 0.1 NaNO₃ /water as the eluent.

The degree of sulfonation was determined by acid/base titration and by elemental analysis.

Solubility:

Poly(styrene sulfonic acid) is soluble in methanol, water and precipitated out from the hexane, THF, toluene.



Size exclusion chromatograph of poly(styrene sulfonic acid) carried out in H₂O) /NaNO₃ as an additive:

$M_n=460,000$, $M_w=523000$ PI=1.15 After Neutralization with NaOH:
 M_n : 509000 M_w/M_n 1.15
degree of Sulfonation : 82.2%

HNMR Spectrum of the Polymer:

