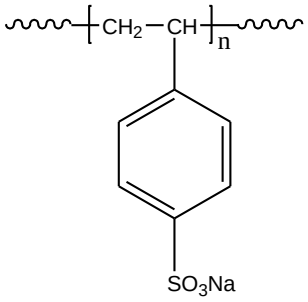
Sample Name:

Poly(4-styrene sulfonic acid-Sodium salt)

In dialysed form or undialysed form

Sample #: **P7605-SSO3Na dialysed form**

Structure:

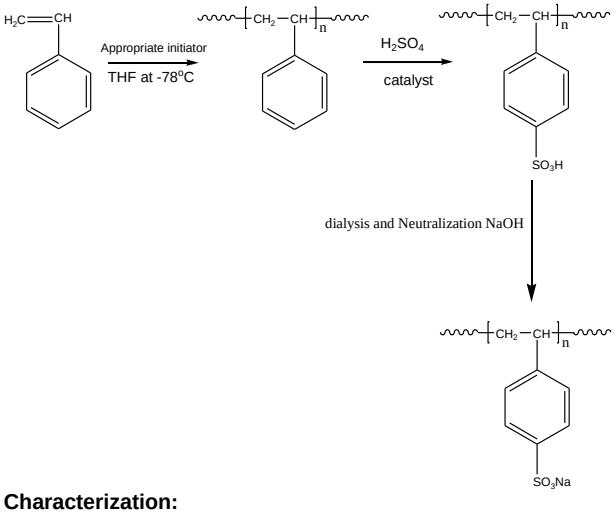


Composition:

Mn x 10^3	PDI
787.0	1.09
C;H;S	40.09: 5.49: 15.29
Degree of sulfonation Elemental analysis and also by titration	>95%

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 H NMR and FTIR spectroscopy of the polymer shows the sulfonation is predominately at para position of the phenyl group. The reaction scheme is illustrated below:



Characterization:

Size exclusion chromatography (SEC) was carried out on a Varian liquid chromatograph equiped 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 indice were calculated. For polystyrene sulfonic acid, a column from Supelco (G5000 PWXL) was used with 0.1 $NaNO_3$ /water as the eluent.

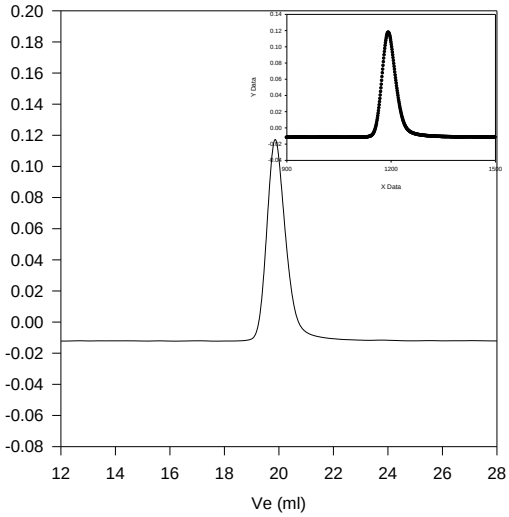
The degree of sulfonation was determined by acid/base titration and by elemental analysis.

Solubility:

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

SEC of Homopolymer:

Poly styrene precursor (lot# P4699) used for the sulfonation P7605-SSO3H



Size exclusion chromatograph of polystyrene:
M_n=405000, M_w=415000, PI=1.09
Solution Viscosity in THF at 35 oC: 1.63dl/g
Radius of Gyration: 27.91nm
after Sulfonation: (% sulfonation over 95%)
Mn of Poly styrene sulfonic acid: 700,000 Mw/Mn 1.09
After Neutralization with NaOH: Mn 787,000 Mw/Mn 1.09
In Box: SEC of the Poly Styrene sulfonic acid

HNMR Spectrum of the Polymer: