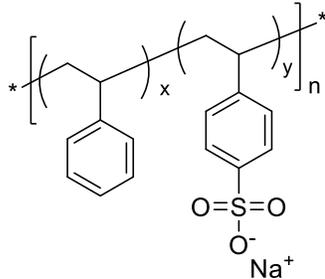


Sample Name:

Poly (styrene-co-4-styrene sulfonic acid sodium salt) ionomer

Sample #: **P41842A-SSO3Na**

Structure:



Composition:

Mn x 10 ³ (g/mol)	M _w /M _n	Degree of sulfonation
11.3	1.03	13 mol%

Synthesis procedure:

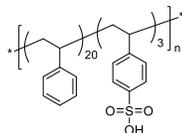
Poly (styrene-co-4-styrene sulfonic acid) was synthesized by partially sulfonation of monodispersed polystyrene, followed by its converting to sodium salt.

Characterization:

The molecular weight and polydispersity of the polymer was determined by size exclusion chromatography (SEC). Degree of sulfonation was calculated by elemental analysis and compared to proton NMR data.

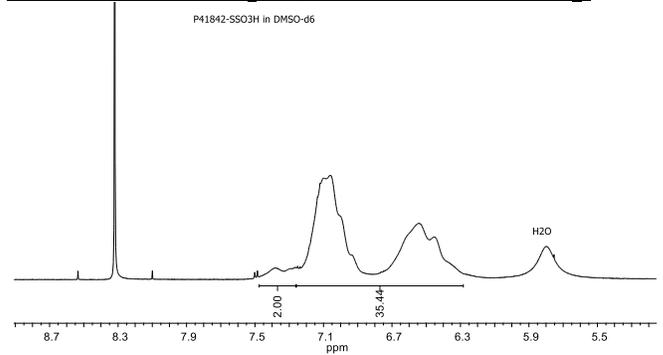
Elemental analysis of poly (styrene-co-4-styrene sulfonic acid) precursor:

Sample: P41842					
Analysis	Method	Result	Basis	Sample Amount Used	Date (Time)
C : Carbon	GLI Procedure ME-14	78.37 %	As Received	1.255 mg	2019-06-17
H : Hydrogen	GLI Procedure ME-14	7.22 %	As Received	1.255 mg	2019-06-17
O : Oxygen	GLI Procedure EB-4	9.18 %	As Received	2.235 mg	2019-06-18
S : Sulfur	GLI Procedure E16-3	3.625 %	As Received	20.345 mg	2019-06-10

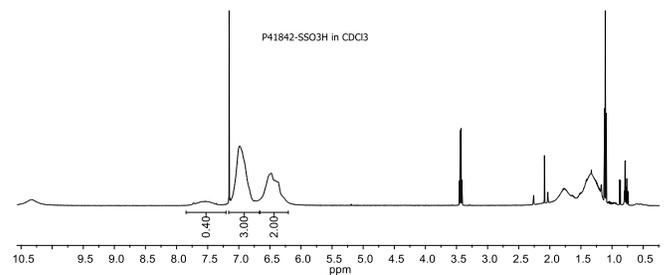


x(PS)=20; y(PS-SO3H)=3
Chemical Formula: C₁₈₄H₁₈₄O₉S₃²⁺
Elemental Analysis: C, 83.85; H, 7.04; O, 5.46; S, 3.65

¹H NMR of P(S-SO₃H) precursor in DMSO-d₆:

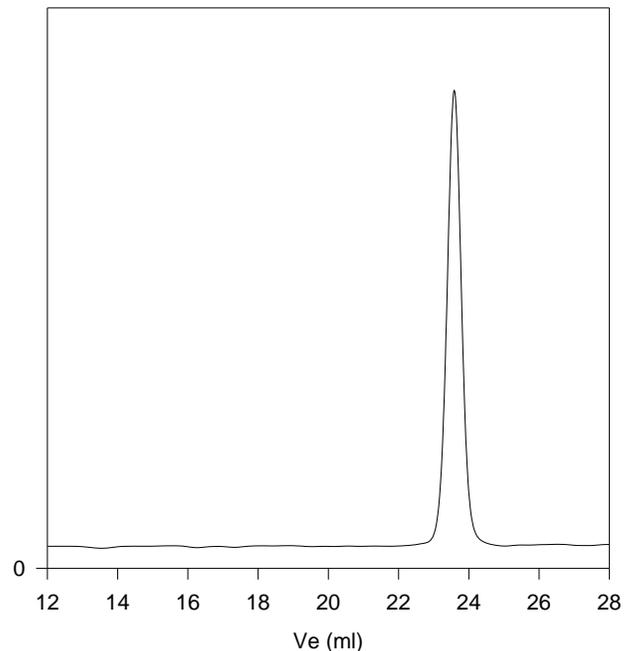


¹H NMR of P(S-SO₃H) precursor in chloroform-d:



SEC chromatogram:

PS precursor to P41842A-SSO₃H/Na



Size exclusion chromatograph of polystyrene:

M_n=10,000 M_w=10,300, PI=1.03

Sulfonation Degree: 13 mol%; M_n=11,000; M_w=11,300; PDI=1.03
SSO3Na: Mn 11,300; Mw: 11,600; PDI=1.03