

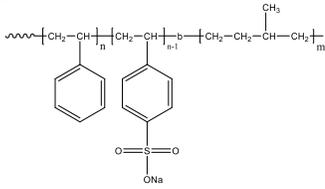
Sample Name: Poly (styrene-co-4-styrene sulfonic acid sodium salt)-b-poly (ethylene propylene)

Polymer obtained by the hydrogenation of (Poly (styrene -b- isoprene rich in 1,4-addition) and its sulfonation on Polystyrene fraction

Sample #: P41837C-SSO3NaMB

Structure:

1,4-rich microstructure for hydrogenated polyisoprene block:



Composition:

Mn x 10 ³ SSO3Na-b-MB	Mw/Mn (PDI)
12.0-b-10.5	1.08
% of sulfonation	5%

Synthesis Procedure:

Poly(styrene-b-isoprene) is prepared by living anionic polymerization in non-polar solvent with sequence addition of styrene followed by isoprene and catalytic hydrogenation, followed by sulfonation.

Characterization:

The product was characterized by size exclusion chromatography (SEC) and ¹H NMR.

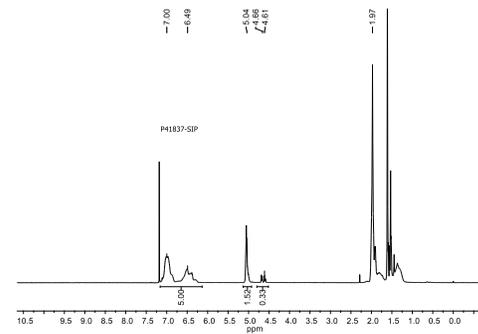
Sample: P41837

Analysis	Method	Result	Basis	Sample Amount Used
C : Carbon	GLI Procedure ME-14	67.73 %	As Received	2.184 mg
H : Hydrogen	GLI Procedure ME-14	8.03 %	As Received	2.537 mg
O : Oxygen	GLI Procedure E8-4	20.81 %	As Received	2.627 mg
S : Sulfur	GLI Procedure E16-3	0.742 %	As Received	16.782 mg

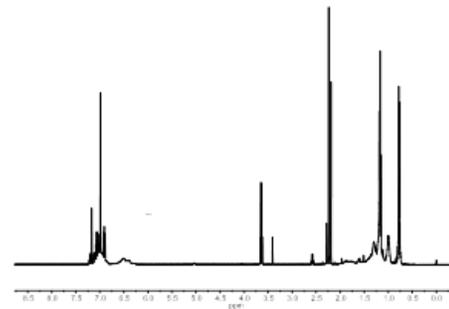
Solubility:

Poly (SSO3H-b-hydrogenated isoprene) is soluble in THF.

¹H-NMR Spectrum of the block copolymer Poly (styrene-b-isoprene):

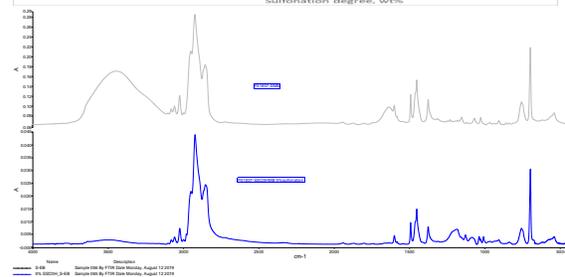
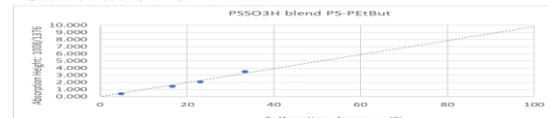


¹H-NMR Spectrum of Poly (styrene-b-isoprene) after Hydrogenation:

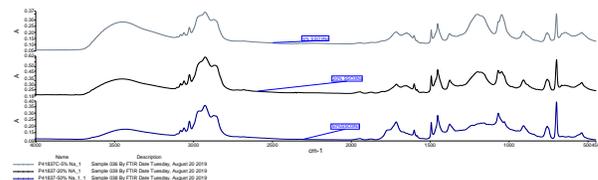


FTIR of the SSO3H-MB

Calibration of FTIR:

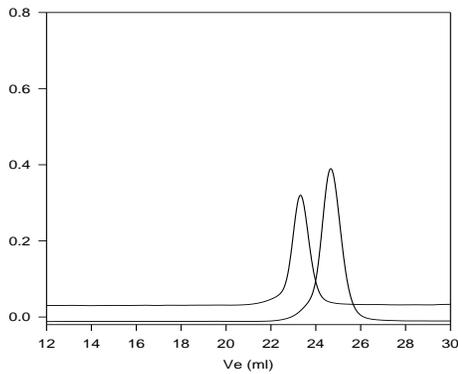


FTIR of PSSO3Na-b-MB at different level of sodium salt:



SEC elugram of the block copolymer:

P41837-SIP

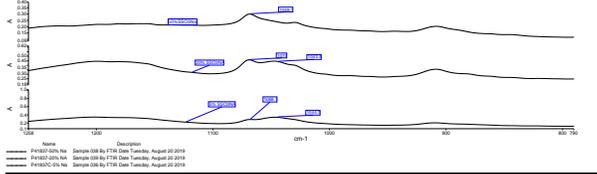


Size exclusion chromatography of polystyrene-b-polyisoprene_{1,4} addition

— Polystyrene, $M_n=11,500$, $M_w=12,500$ $PI=1.09$

— Block Copolymer:
PS-IP(11,500)-b-PI(10,500), $PI=1.08$ (by H NMR)

Characteristics of FTIR absorbances changes with different degree of sulfonation in their sodium salt:



In FTIR there is difference of or different level of sulfonation in the region from 1100cm⁻¹ to 1000 cm⁻¹.

At 5% Sulfonation level 1044cm⁻¹ the height is higher than at 1068cm⁻¹

At 20% sulfonation level the 1068cm⁻¹ height is higher than 1044cm⁻¹

At 50% sulfonation level 1068 cm⁻¹ is prominent and 1044 completely disappear or weak