

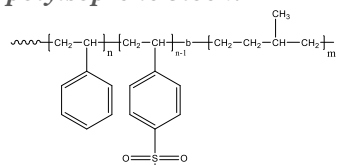
Sample Name: Poly (styrene-co-4-styrene sulfonic acid sodium salt)-b-poly (ethylene propylene)

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

Sample #: P41837E-SSO3NaMB

Structure:

1,4-rich microstructure for hydrogenated polyisoprene block:



Composition:

Mn x 10 ³ SSO3Na-b-MB	Mw/Mn (PDI)
16.0-b-10.5	1.08

% of sulfonation	50%
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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.

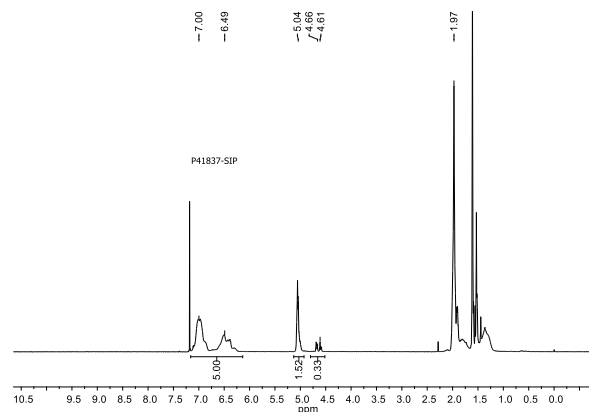
Sample: P41837-B

Analysis	Method	Result	Basis	Sample Amount Used
C : Carbon	GLI Procedure ME-14	62.97 %	As Received	1.116 mg
H : Hydrogen	GLI Procedure ME-14	8.28 %	As Received	2.083 mg
O : Oxygen	GLI Procedure E8-4	22.43 %	As Received	1.457 mg
S : Sulfur	GLI Procedure E16-3	6.29 %	As Received	26.648 mg

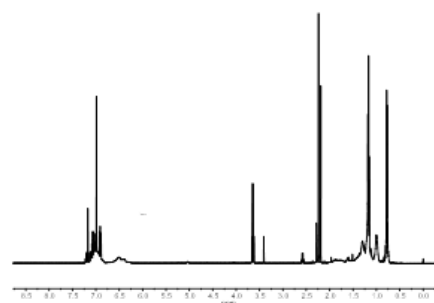
Solubility:

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

¹H-NMR Spectrum of the block copolymer:

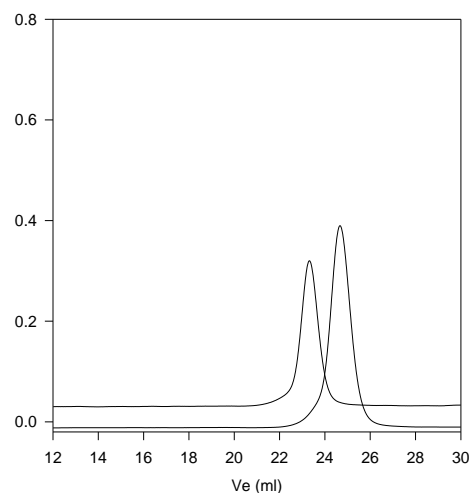


¹H-NMR Spectrum of the Poly (styrene-b-isoprene) after Hydrogenation:



SEC elugram of the block copolymer:

P41837-SIP



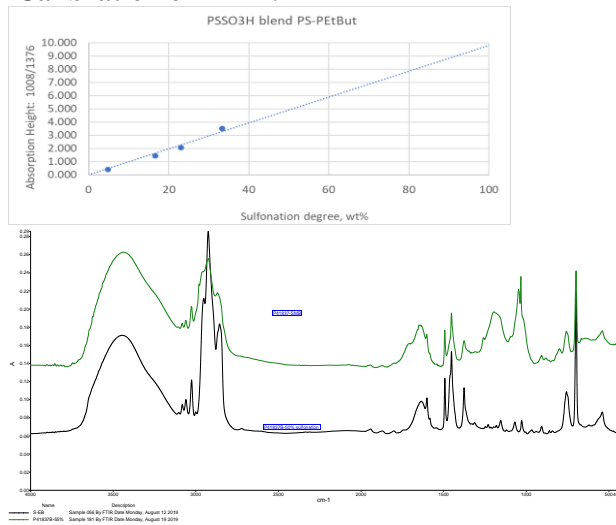
Size exclusion chromatography of polystyrene-b-polyisoprene_{1,4 addition}

— Polystyrene, M_n=11,500, Mw=12,500 PI=1.09

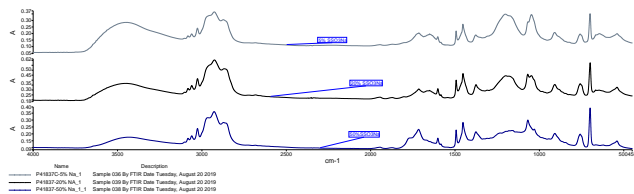
— Block Copolymer:
PS-IP(11,500)-b-PI(10,500), PI=1.08 (by H NMR)

FTIR of the SSO3H-MB

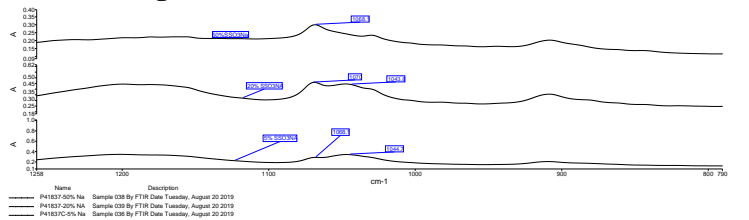
Calibration of FTIR:



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



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



In FTIR there is difference of for 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