

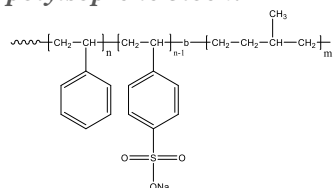
**Sample Name:** Poly (styrene-co-4-styrene sulfonic acid sodium salt)-b-poly (ethylene propylene)

**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 <sup>3</sup> 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 <sup>1</sup>H NMR.

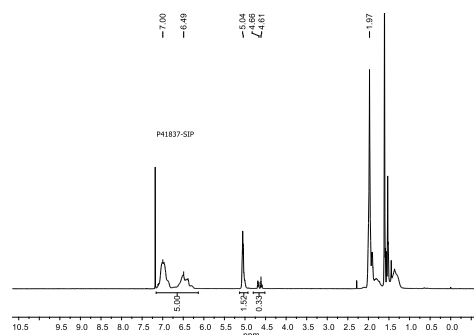
**Sample:** P41837

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	20.61 %	As Received	2.627 mg
S : Sulfur	GLI Procedure E16-3	0.742 %	As Received	16.782 mg

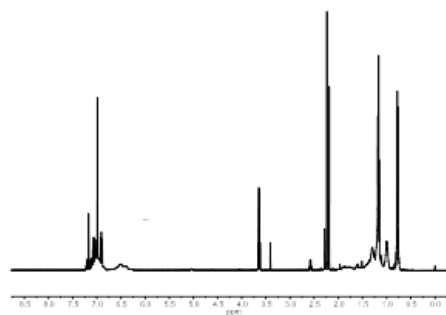
### Solubility:

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

### <sup>1</sup>H-NMR Spectrum of the block copolymer Poly (styrene-b-isoprene):

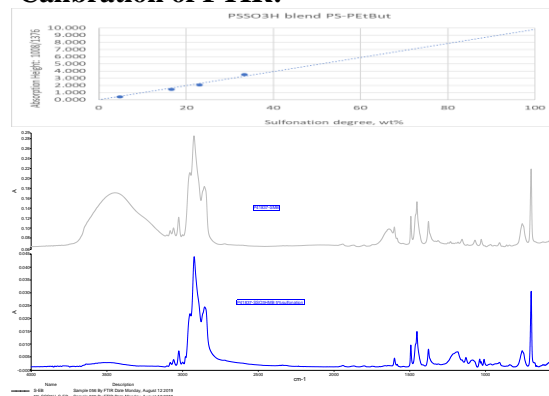


### <sup>1</sup>H-NMR Spectrum of Poly (styrene-b-isoprene) after Hydrogenation:

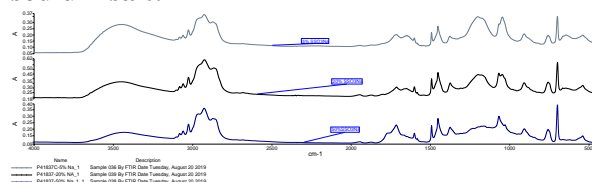


### FTIR of the SSO3H-MB

#### Calibration of FTIR:

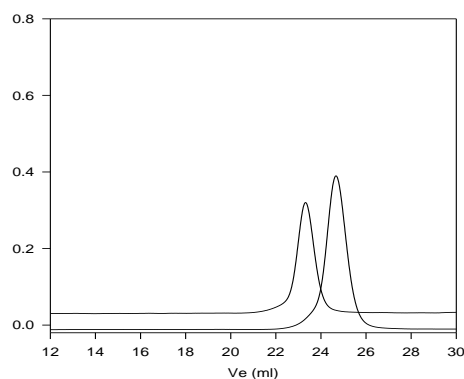


### FTIR of PSSO3Na-b-MB at different level of sodium salt:



## **SEC elugram of the block copolymer:**

**P41837-SIP**

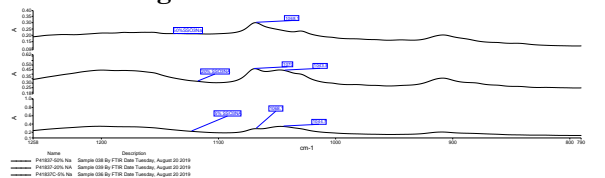


Size exclusion chromatography of polystyrene-b-polyisoprene<sub>1,4</sub> addition

— 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  $^1H$  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