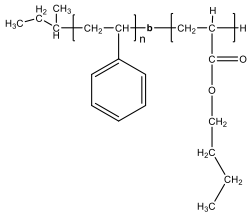
Product Profile

Identification

Product Name: Poly(styrene)-b-poly(n-butyl acrylate)
Product Lot Number: P45157A-SnBuA
Product Chemical Architecture:



Composition:

Mn x 10^3 P(S-b-nBuA)	Mw/Mn (PDI)
105.0-b-108.0	1.13
PolyStyrene: 48 mole%	

Method of Synthesis

Poly(styrene-b-n.acrylate) is prepared by living anionic polymerization in THF at –78 °C using sec.BuLi initiator adduct with α-methyl styrene in the presence of LiCl. tert.butyl acrylate (tBuA) monomer was added after dilution in THF. More details are available in the published literature.1-3. The obtained polymer converted to Poly(s-b-n-Butyl acerylate) by transesterification in presence of n butanol. Over 99% reaction verified by its HNMR spectrum.

1. S. K. Varshney, R. Fayt, Ph. Teyssie, and J.P. Hautekeer US Patent 5,264,527 (1993)
2. Ph. Teyssie, R. Fayt, J. P. Hautekeer, C. Jacobs, R. Jerome, L. Leemans and S. K. Varshney Makromolekular Chemie, Macromol. Symp., 1990, 32,61-73.
3. S. K. Varshney, J. P. Hautekeer, R. Fayt, R. Jerome, and Ph.Teyssie Macromolecules, 1990, 23, 2618-2622.

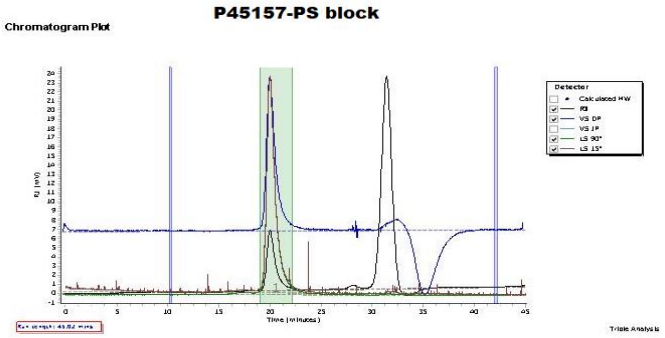
Solubility in different solvents

THF	√		
CHCl3	**X**	DMF	√
Toluene-Hot	**X**	THF-Methanol	√

Purification of Polymer to remove any homo polystyrene fractions.

Validation of Architecture:

A. <u>Gel Permeation Chromatography (GPC), SEC- Profile</u>

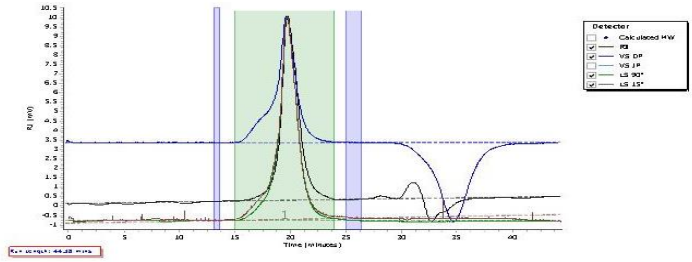


Molecular Weight Averages

Peak	Mp (g/mol)	Mn (g/mol)	Mw (g/mol)	Mz (g/mol)	Mz+1 (g/mol)	Mv (g/mol)	PD
Peak 1	108238	106654	106745	106834	106920	106884	1.001

Chromatogram Plot

P45157-StBuA



Molecular Weight Averages

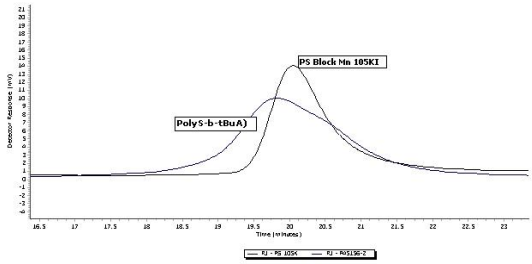
Peak	Mp (g/mol)	Mn (g/mol)	Mw (g/mol)	Mz (g/mol)	Mz+1 (g/mol)	Mv (g/mol)	PD
Peak 1	246626	212632	241658	278904	338189	288265	1.137

After conversation to P(S-b-nBuA)

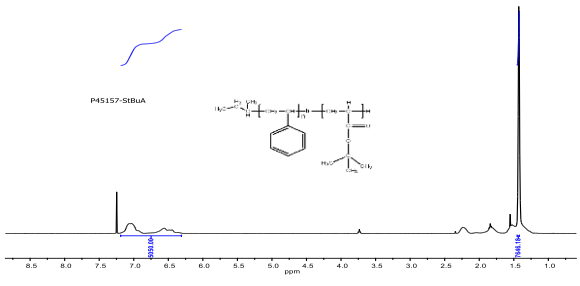
Workspace Details

Workspace name	Calibration 2025-01-13
Location	D:\GPC\Workspaces\Calibration 2025-01-13\
Comments	
Created by	Agilent2 at 11:17:56 AM on January 13, 2025

Chromatogram Plot



B. HNMR of the polymer run in CdCl3: P(S-b-tBuA)



HNMR of the polymer run in CdCl3: P(S-b-nBuA)