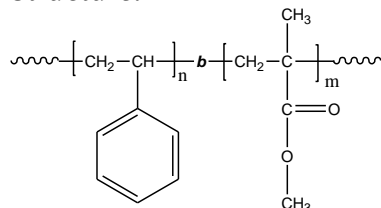


Sample Name: Poly(styrene-*b*-methyl methacrylate)
(polymethylmethacrylate rich in syndiotactic contents > 78%)

Sample #: P10119P-SMMA

Structure:



Composition:

Mn x 10 ³ S-b-MMA	PDI
540.0-6460.0	1.09
T _g for PS block: 110°C	T _g for PMMA block: 124°C
Microstructure of PMMA block	S:H:I 70:29:1

Synthesis Procedure:

Poly(styrene-*b*-methyl methacrylate) is prepared by living anionic polymerization in THF at -78 °C using cumyl potassium initiator in the presence of LiCl. Polystyrene macroanions were end capped with a unit of diphenyl ethylene (DPE) before adding methylmethacrylate (MMA) monomer. For further details please see our published articles.¹⁻⁵ The scheme of the reaction is illustrated below:

Characterization:

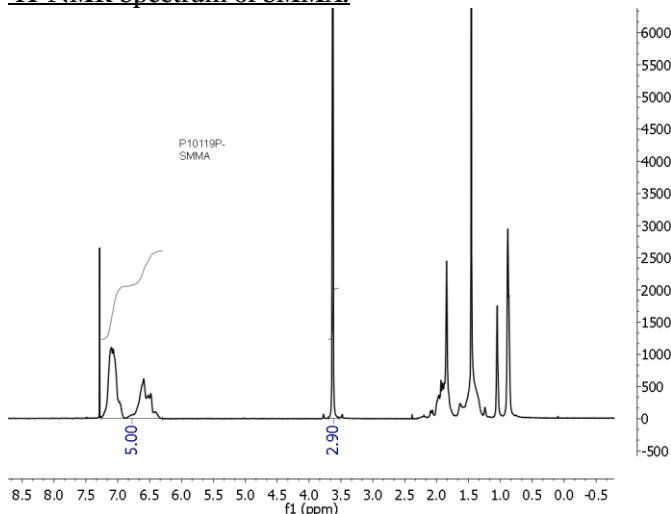
An aliquot of the anionic polystyrene block was terminated before addition of MMA and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ¹H-NMR spectroscopy by comparing the peak area of the poly(methyl methacrylate) protons (eg. -OCH₃ at 3.6ppm) with the of aromatic protons of polystyrene at 6.3-7.2 ppm. Copolymer PDI is determined by SEC.

Thermal analysis of the samples was carried out using a differential scanning calorimeter (TA Q100) at a heating rate of 15°C/min. The inflection glass transition temperature (T_g) of the sample has been considered.

Solubility:

Poly(styrene-*b*-methyl methacrylate) is soluble in THF, toluene, dioxane and CHCl₃. This polymer readily precipitates from methanol, ethanol, hexanes and water.

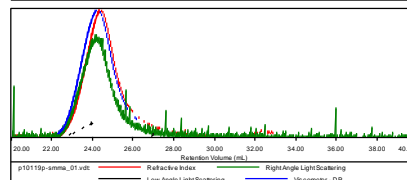
¹H-NMR Spectrum of SMMA:



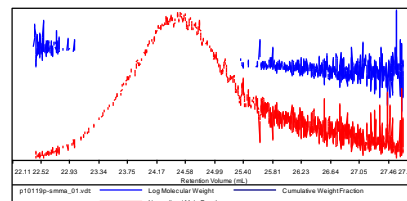
SEC of Sample -SMMA:

Sample ID: P10119P-SMMA

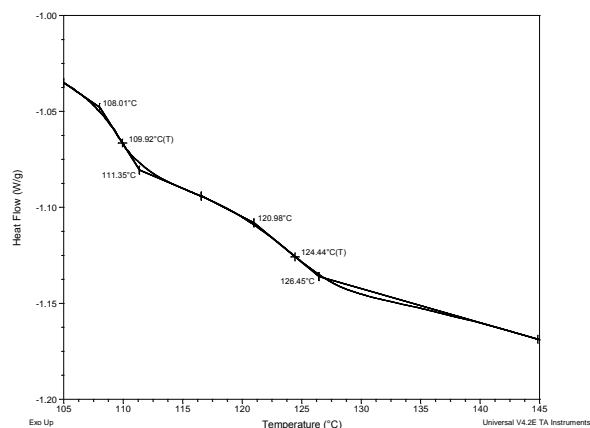
Concentration (mg/mL)	1.0164
Sample dilution (mL/g)	0.1350
Method File	PSBOK-OCT-2013-0003.ucm
Column Set	3x PL 1113-6300
System	System 1



Sample	Mn	Mw	Mp	Mw/Mn	IV
p10119p-smma_01.vst	1.009 e 6	1.106 e 6	1.106 e 6	1.096	2.9343



Thermogram for the sample



References for further information:

- S. K. Varshney, R. Fayt, Ph. Teyssie, and J.P. Hautekeer US Patent 5,264,527 (1993)
- Ph. Teyssie, Ph. Bayard, R. Jerome, S. K. Varshney, and J. S. Wang, *35th IUPAC International Union of Pure & Applied Chemistry International Symposium on Macromolecules* 1994, 67.
- Ph. Teyssie, R. Fayt, J. P. Hautekeer, C. Jacobs, R. Jerome, L. Leemans and S. K. Varshney *Makromolekulare Chemie, Macromol. Symp.*, 1990, 32,61-73.
- S. K. Varshney, J. P. Hautekeer, R. Fayt, R. Jerome, and Ph.Teyssie *Macromolecules*, 1990, 23, 2618-2622.
- R. Jerome, R. Forte, S. K. Varshney, R. Fayt, and Ph. Teyssie "The Anionic Polymerization of Alkylacrylates: A Challenge" in the Recent Advances in Mechanistic and Synthetic Aspects of Polymerization: M. Fontanille and A. Guyot Ed., NATO ASI Series C 215,101 (1987), *C.A Vol. 108*, 12, 094992.