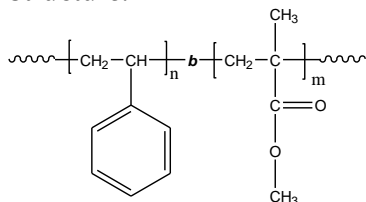


**Sample Name:** Poly(styrene-*b*-methyl methacrylate)

*(polymethylmethacrylate rich in atactic contents)*

**Sample #:** P10937-SMMA

**Structure:**



**Composition:**

Mn x 10 <sup>3</sup> S-b-MMA	PDI
4.2-b-2.6	1.25
T <sub>g</sub> for PS block: 97°C	T <sub>g</sub> for PMMA block: 111°C
Microstructure for PMMA block	Syndio:hetero:iso contents 42:50:8

### 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.<sup>1-5</sup>

### Characterization:

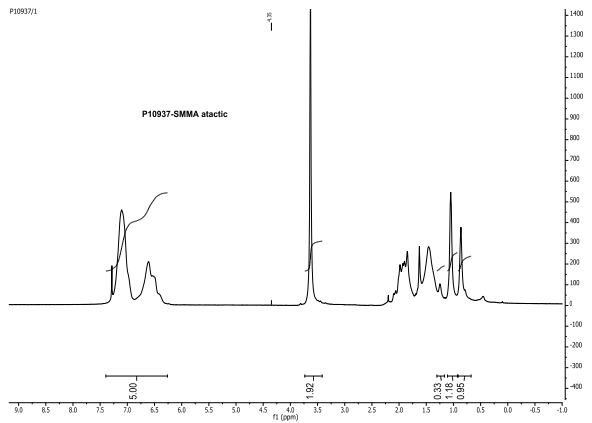
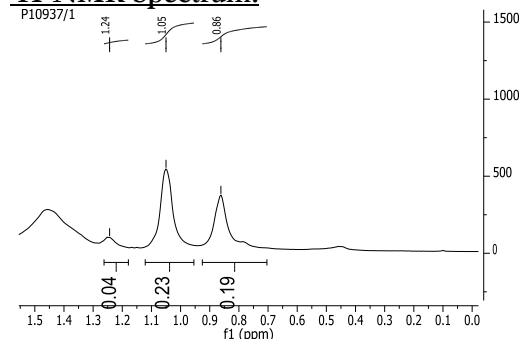
An aliquot of the anionic polystyrene block was terminated before addition of MMA and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from <sup>1</sup>H-NMR spectroscopy by comparing the peak area of the poly(methyl methacrylate) protons (eg. -OCH<sub>3</sub> 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<sub>g</sub>) of the sample has been considered.

### Solubility:

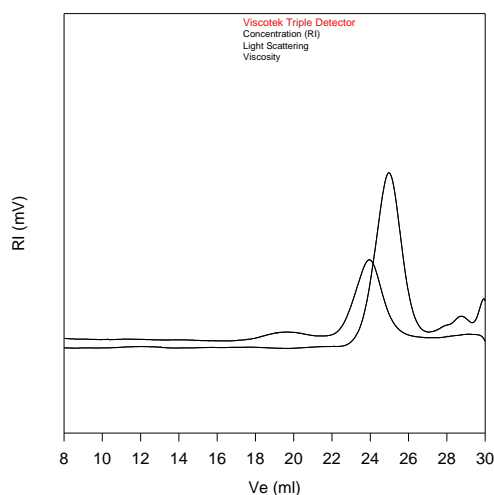
Poly(styrene-*b*-methyl methacrylate) is soluble in THF, toluene, dioxane and CHCl<sub>3</sub>. This polymer readily precipitates from methanol, ethanol, hexanes and water.

### <sup>1</sup>H-NMR Spectrum:



### SEC of Sample SMMA:

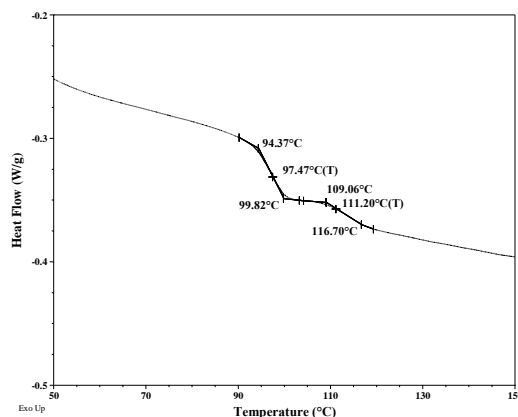
#### P10937-SMMA



Size Exclusion Chromatography of Poly Styrene-*b*-MMA

— PS block M<sub>n</sub> = 4,200, M<sub>w</sub> = 5,300, M<sub>w</sub>/M<sub>n</sub> = 1.25  
Ps-*b*-MMA: Mn 4200-b-2,600 PI: 1.25

### Thermogram of the sample:



### References for further information:

1. S. K. Varshney, R. Fayt, Ph. Teyssie, and J.P. Hautekeer US Patent 5,264,527 (1993)
2. 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.
3. 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.
4. S. K. Varshney, J. P. Hautekeer, R. Fayt, R. Jerome, and Ph.Teyssie *Macromolecules*, 1990, 23, 2618-2622.
5. 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.