Sample Name: Poly(styrene-b-ethyl methacrylate)
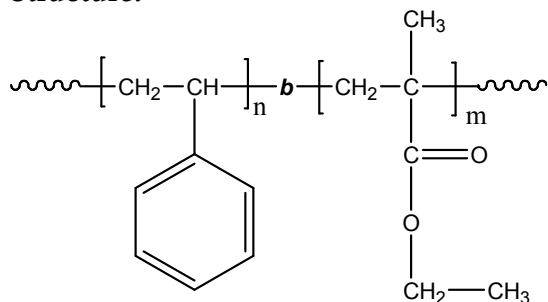*(poly ethylmethacrylate rich in syndiotactic contents > 78%)*

Sample #: P8471-SEMA

Structure:

Composition:

Mn x 10³ S-b-EtMA	PDI
10.0-8.0	1.08

Glass transition temperature at a glance

T_g for PS block	Not distinct
T_g for MMA block	80°C

Synthesis Procedure:

Poly(styrene-b-ethyl methacrylate) is prepared by living anionic polymerization in THF at –78 °C using sec.BuLi initiator in the presence of LiCl. Polystyrene macroanions were end capped with a unit of diphenyl ethylene (DPE) before adding ethylmethacrylate (EtMA) monomer. For further details please see our published articles.

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

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min.The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Solubility:

Poly(styrene-b-ethyl methacrylate) is soluble in THF, toluene, dioxane and CHCl₃ . This polymer readily precipitates from methanol, ethanol, hexanes and water.
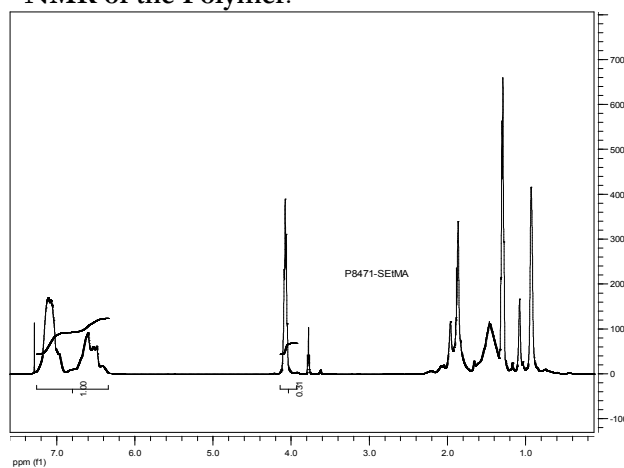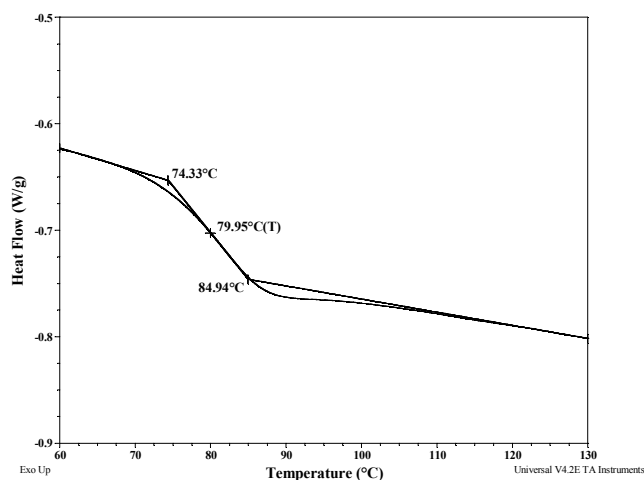
SEC of Sample :
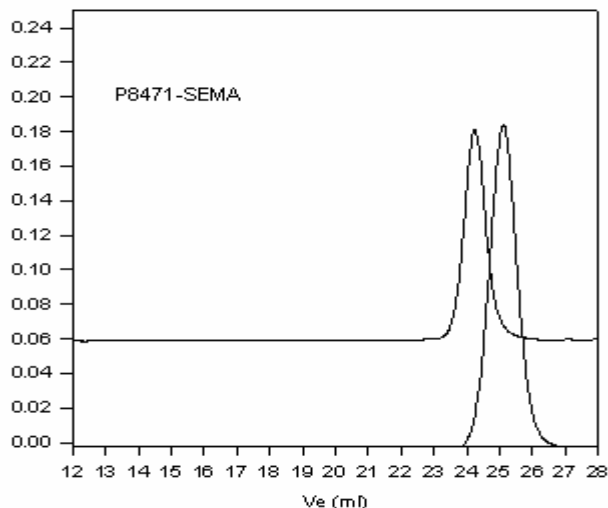
Size Exclusion chromatography of poly (styrene-b-ethyl methacrylate):

— Polystyrene, M$_n$=10,00, M$_w$=10,500, PI=1.05

— Block Copolymer PS(10,000)-b-PEtMA(8,000), PI=1.08
Composition from ^{H} NMR

^{H}NMR of the Polymer:

Thermogram for EMA block:

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.*