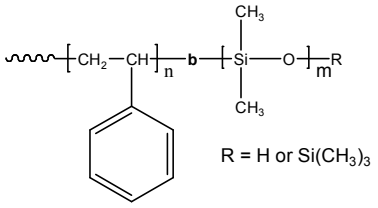
Sample Name:
Poly(styrene-b-dimethyl siloxane)
Sample #: P612-SDMS (R=H)

Structure:



Composition:

Mn x 10^3 S-b-DMS	Mw/Mn (PDI)
53.3-b-4.70	1.04
T_g for PS block: 103°C	T_g for DMS block: -127°C (Lit. value)

Synthesis Procedure:

Poly(styrene-b-dimethyl siloxane) is prepared by living anionic polymerization with sequence addition of styrene followed by hexamethyl cyclotrisiloxane. For the details please see the references.

Characterization:

An aliquot of the polystyrene block was terminated before addition of hexamethyl cyclotrisiloxane and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ^{1}H-NMR spectroscopy by comparing the peak area of the styrene protons at 6.3-7.2 ppm with the peak area of siloxane protons near 0.13 ppm. Block copolymer PDI is determined by SEC.

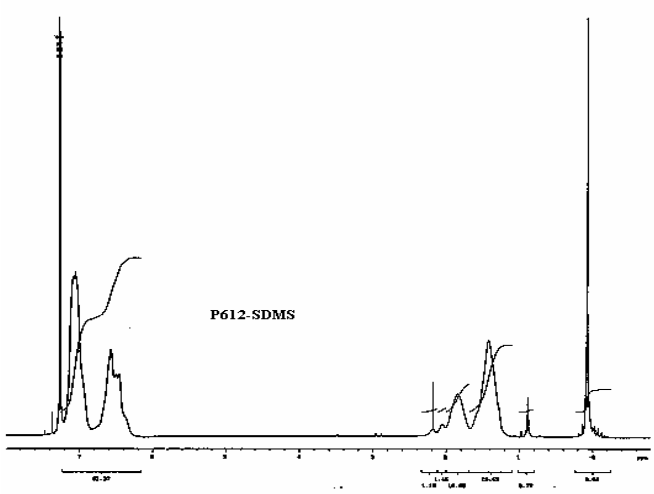
Thermal analysis

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

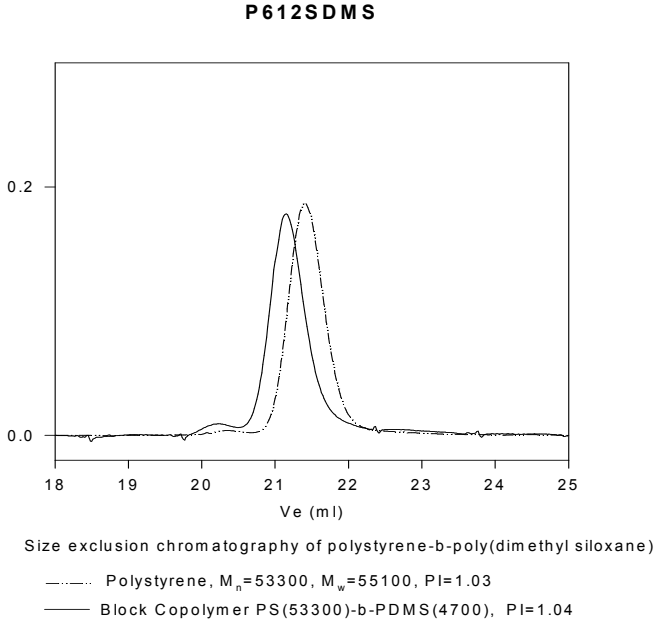
Solubility:

Poly(styrene-b-dimethyl siloxane) is soluble in CHCl3, toluene, THF.

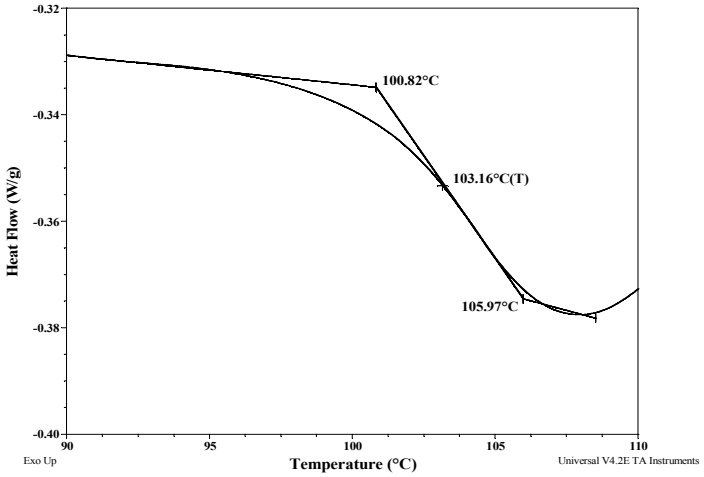
^{1}H NMR spectrum of the sample



SEC profile of the block copolymer



Thermogram for PS block



References:

A) S. K. Varshney, D. N. Khanna "Hexamethylcyclotrisiloxane-Styrene Block Copolymers and their Chemical Composition" *CA Vol. 093, 26, 240325,. J. Appl. Polym. Sci., 1980, 25, 2501-2511. B)* P. Bajaj, S. K. Varshney, "Morphology and Properties of Poly(Dimethylsiloxane-b-Styrene-b-Dimethylsiloxane) Polymers" *CA Vol. 093, 02, 008652, Polymer, 1980, 21, 201-206. (C)* S. K. Varshney, C. L. Beatty "Synthesis and Characterization of Polymethylmethacrylate and Polydimethylsiloxane Block Copolymers Polymerizes with an Organometallic Initiator" *Org. Coat. Appl. Polym. Sci., 1981, 45, 151-157. d).* S. K. Varshney, C. L. Beatty, and P. Bajaj "Morphology and Properties of Styrene and Dimethylsiloxane Triblock and Multiblock Copolymers" *CA Vol. 098, 139, 017855, Am. Chem. Soc. Polym. Prepr., 1981, 22, 321-323.*