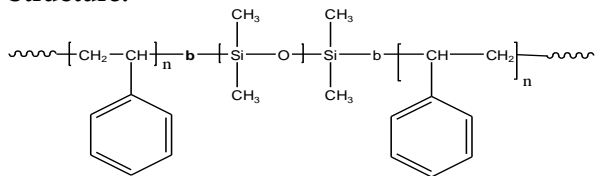


Sample Name:

Poly(styrene-b-dimethyl siloxane-b-styrene)

Sample #: P8704A-SDMSS**Structure:****Composition:**

$M_n \times 10^3$ S-b-DMS-b-S	M_w/M_n (PDI)
19.0-b-10.0-b-19.0	1.10
T_g for PS block: 99°C	T_g for DMS block: -127°C (Lit.)

Synthesis Procedure:

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

Characterization:

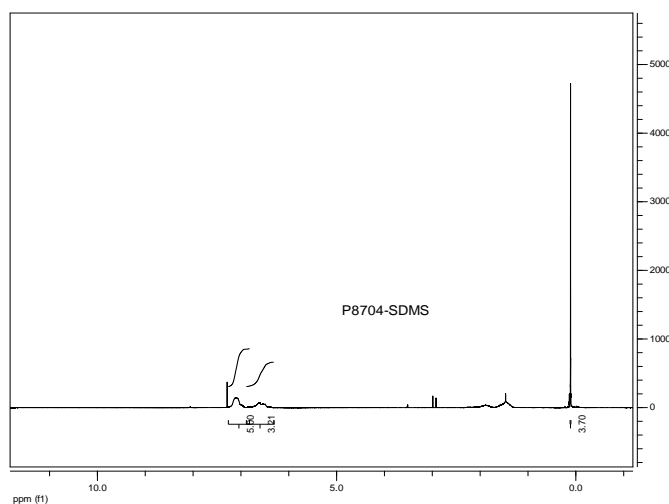
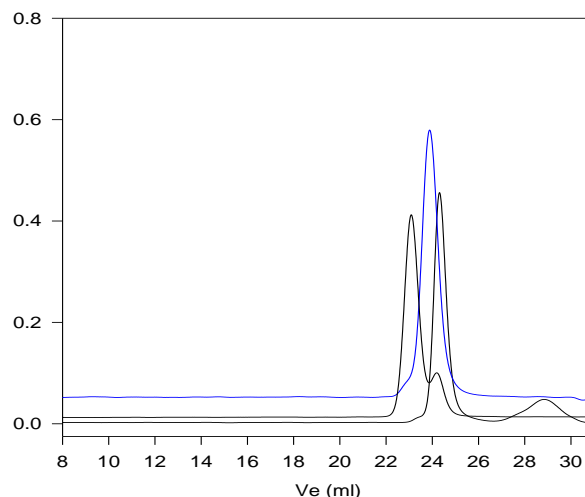
An aliquot of the polystyrene block was terminated before addition of hexamethyl cyclotrisiloxane and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from $^1\text{H-NMR}$ spectroscopy 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 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-dimethyl siloxane-Styrene) is soluble in CHCl_3 , toluene and THF.

 $^1\text{H-NMR}$ spectrum of the sample:**SEC profile of the block copolymer****P8704A-SDMS**

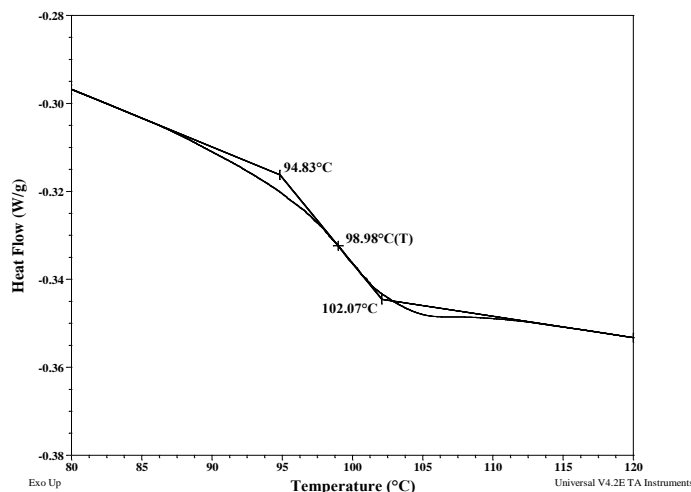
Size exclusion chromatography of poly(styrene-b-dimethylsiloxane)

— Polystyrene, $M_n=19000$, $M_w=20,000$, $M_w/M_n=1.06$

— Poly(styrene-b-dimethylsiloxane)

 M_n : PS(19,000)-b-PDMS(10,000)-b-PS(19,000) $M_w/M_n=1.10$

It contain about 5% unlinked diblock copolymer

DSC thermogram for PS block:**References:**

- 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.
- 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.
- 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.
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