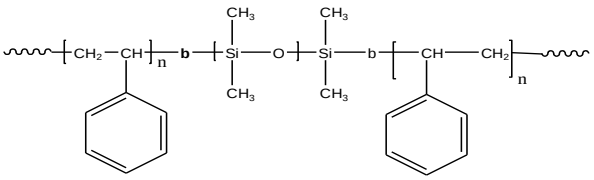
Sample Name:
Poly(styrene-b-dimethyl siloxane-b-styrene)
Sample #: P10782-SDMSS
Structure:



Composition:

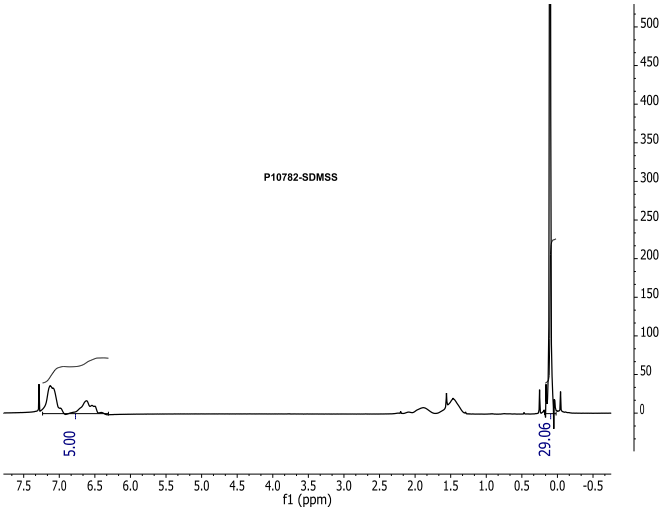
Mn ×10³ S-b-DMS-b-S	Mw/Mn (PDI)
19.5-b-130.0-b-19.5	1.3
Coupling %	>92%
Presence of Homopolystyrene fraction	About 10 %

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.

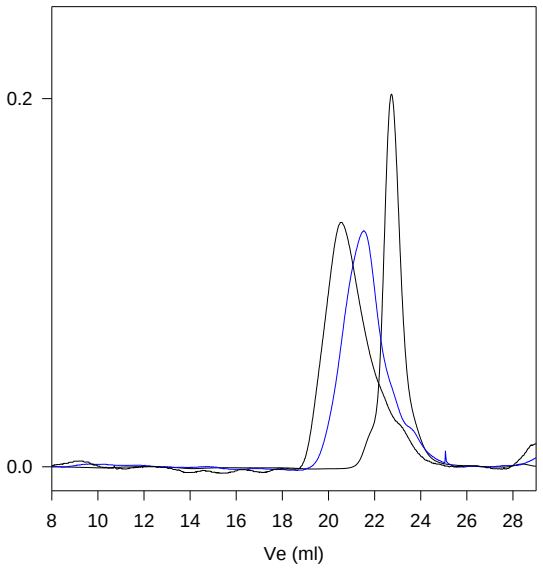
Characterization: By size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ^{1}H-NMR spectroscopy by comparing the peak area of the styrene protons at 6.3-7.2 ppm with the peak area of siloxane protons 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 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).

^{1}H NMR spectrum of the sample:



SEC profile of the block copolymer
P10782-SDMSS



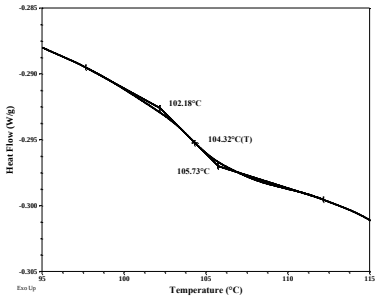
Size exclusion chromatography of poly(styrene-b-dimethylsiloxane-b-Styrene)

Polystyrene, M_n=19,500 Mw: 21,300 M_w/M_n=1.09

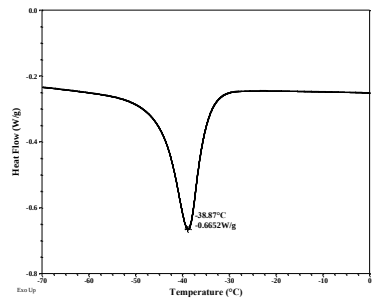
Poly(styrene-b-dimethylsiloxane)
M_n: PS(19,500)-b-PDMS(65,000)=1.22
After linking reaction:
PS-b-DMS-b-PS Mn 19,500-b-130,000-b-19,500 Mw/Mn = 1.3

DSC thermogram for PS block:

T_g of Polystyrene block:



T_m of Polydimethylsiloxane:



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.*

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.*