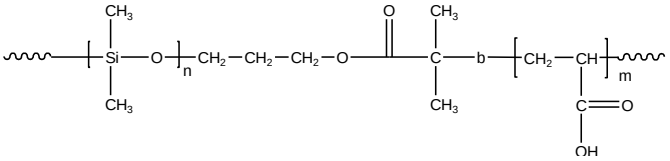
Sample Name: **Poly(dimethyl siloxane -b- acrylic acid)**

Sample #: **P6451-DMSAA**

Structure:

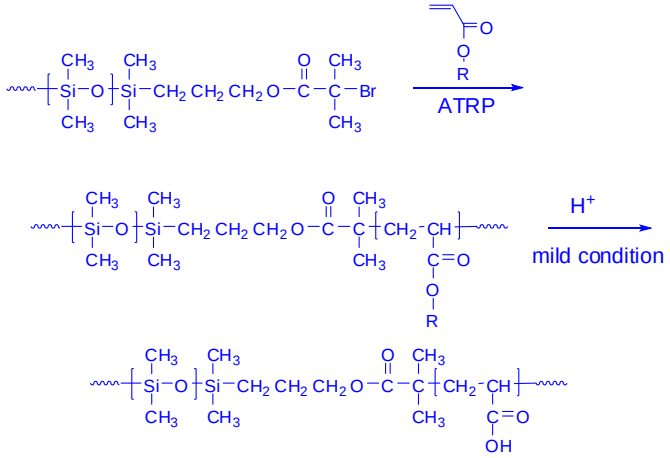


Composition:

Mn x 10^3 PDMS-b-PAA (k)	PDI
8.0-b-9.4	1.52

Synthesis Procedure:

Poly(dimethyl siloxane -b- acrylic acid) is prepared by living anionic polymerization of hexamethyl cyclotrisiloxane followed by controlled radical polymerization of protected acrylic acid monomer. The reaction scheme is shown below:



Characterization:

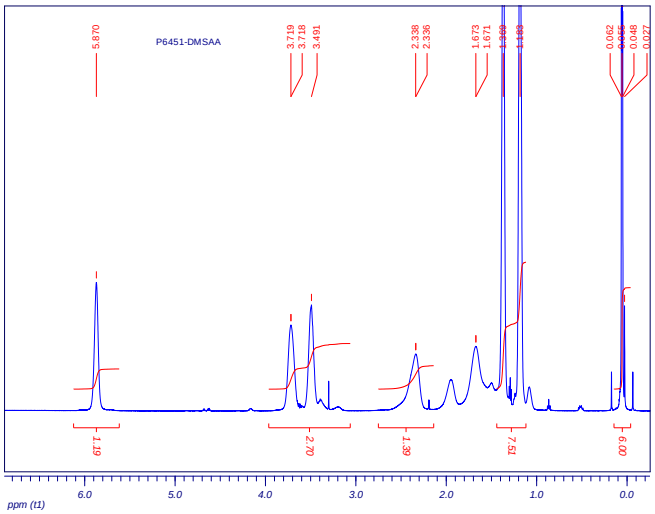
An aliquot of the Poly(dimethyl siloxane) block was terminated before controlled radical polymerization of the protected acrylate block and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from ^{1}H-NMR spectroscopy by comparing the peak area of the siloxane protons at about 0 ppm with the peak area of the acrylic acid protons at about 1-2.5 ppm. The composition is also calculated according to FTIR showed as followed graph. The results from NMR and FTIR are compatible.

Note: The protected polyacrylic acid may cause the SEC profile broadening. We still claim the Mw/Mn as the apparent molecular weight. Real Mw/Mn should be narrower

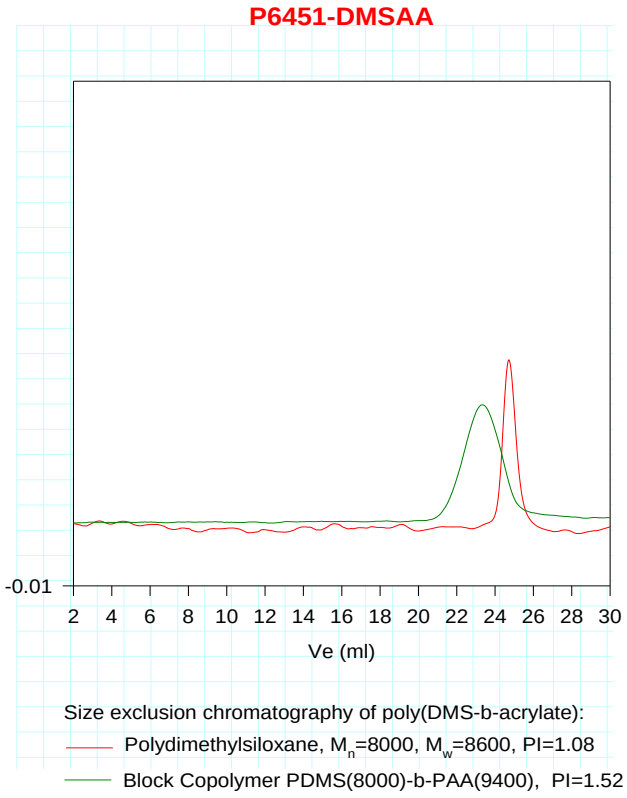
Solubility:

Poly(dimethyl siloxane -b- acrylic acid) is soluble in THF, chloroform and dichloromethane. It did not precipitate well in methanol or hexanes because of its amphiphilic character.

^{1}H-NMR Spectrum of the block copolymer:



SEC profile of the block copolymer:



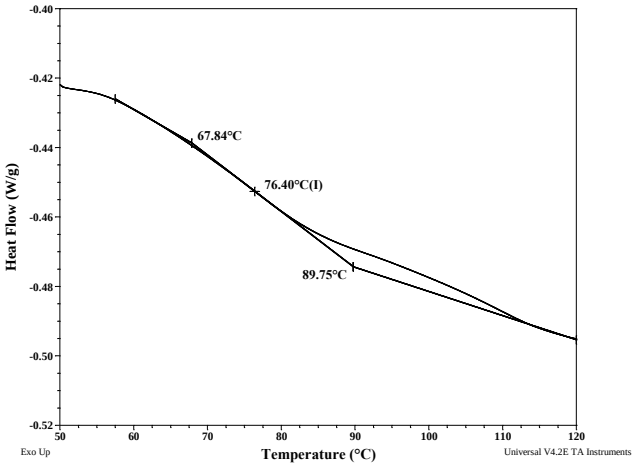
Thermal analysis of the sample P6451-DMSAA

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10^{o}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).

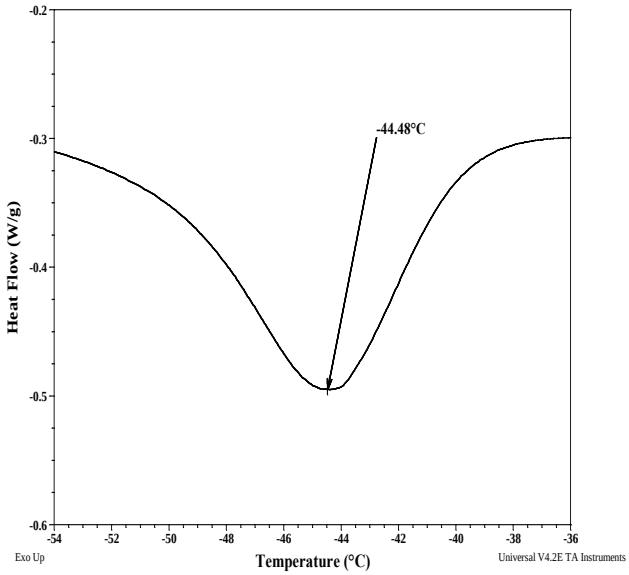
Melting and crystallization curve for the sample

The melting temperature (T_m) was taken as the maximum of the endothermic peak where as the crystallization temperature (T_c) was considered as the minimum of the exothermic peak.

Thermogram for the sample



Melting curve for DMS block:



Crystallization curve for DMS block: