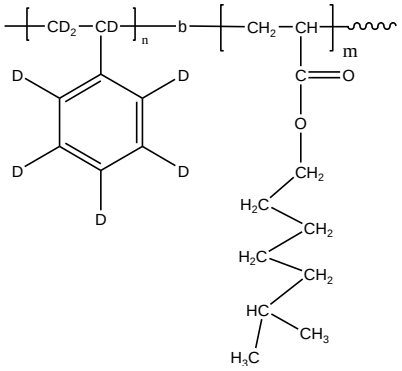
Sample Name: Deuterated Poly(styrene(d8)-b- isooctyl acrylate) (protonated)

Sample #: P9308-dPSisoOctA

Structure:



Composition:

Mn x 10^3 dPS-b-IsoOctA	PDI
27.0-b-13.0	1.13
T_g for Iso OctylAcrylate block: -44 ^oC	T_g for PS block: 87 ^0C

Synthesis Procedure:

Deuterated Poly(styrene (d8) -b-isooctyl acrylate) is prepared by the tranesterification of the deuterated poly (Styrene (d8)-b-tert.butyl acrylate) di block copolymer in presence of isooctanol (pure isoctanol with no isomer synthesized) . Esterification of tert-butyl ester to isooctanol ester is confirmed by complete disappearance of aborbance at 1360 cm-1 characteristics for the tert.butyl ester.

Purification of the obtained polymer was carried out rigorously as follows to ensure the removal of the catalyst side product:

1. Dissolved the polymer in $CHCl_3$ and wash with de-ionized distilled water to remove the any soluble organic catalyst used in the trans esterification side product.
2. Polymer extracted from water with chloroform.
3. Polymer solution in CHCl3 was dried over anhydrous sodium sulfate.
4. Solution filtered and than passed through a column packed with basic Al_2O_3.
5. Solution concentrated on rota-evaporator
6. Solution precipitated in cold methanol
7. Final polymer freeze dried from dioxane.

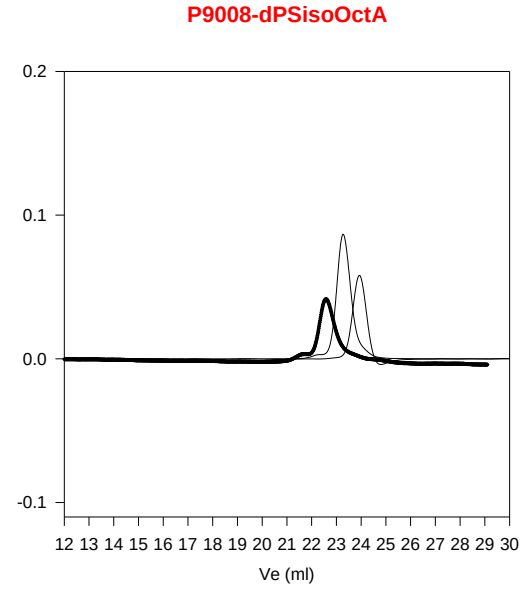
Characterization:

An aliquot of the polystyrene block was terminated before addition of tert.butyl acrylate and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition and Mw/Mn (PDI) for the final polymer after trans-esterification to isooctyl acrylate is determined by SEC.

Solubility:

Polymer is soluble in $CHCl_3$, THF and toluene.

SEC of the block copolymer:



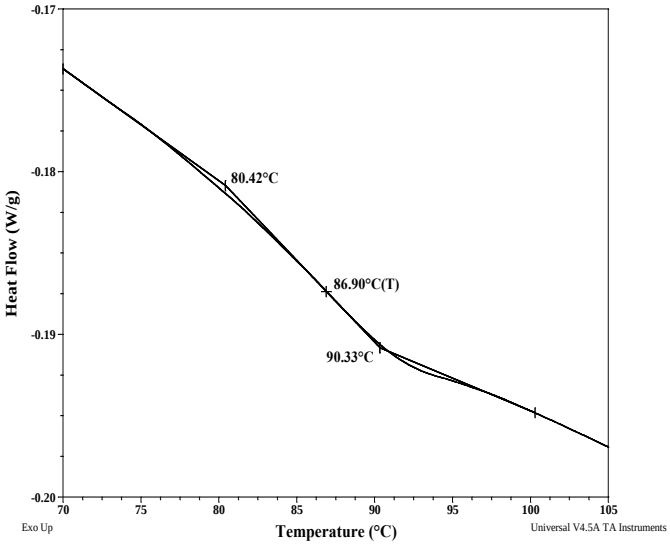
Size exclusion chromatography of deuterated (d8) polystyrene-poly(t-butyl acrylate)

—— Deuterated Polystyrene, M_n=-27000, M_w=28500, PI=1.06
—— Block Copolymer PdSt(27000)-b-PtBuA(9000), PI=1.07
After tranesterification with isoocatonl: Mn 27,000-b-13,000 Mw/Mn 1.13

Thermal analysis of sample P9308 dPSisoOctA

Thermal analysis of the sample was carried out using a differential scanning calorimeter (TA Q100) at a heating rate of 10°C/min. The inflection glass transition temperature (T_g) after second thermal scan is reported here.

Thermogram for PS block:



Thermograms for IsoOCtA block: