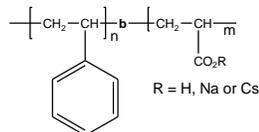


## Sample Name: Poly (styrene -b- acrylic acid)

Sample #: P42335A-SAA

### Structure:

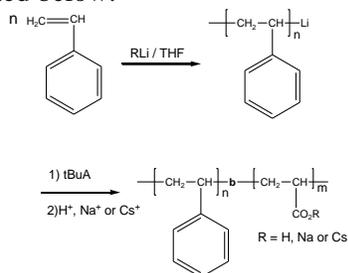


### Composition:

Mn × 10 <sup>3</sup> PS-b-PAA	PDI
4.5-b-17.0	1.04
T <sub>g</sub> for PS block: Not distinct	T <sub>g</sub> for AA block: 115°C

### Synthesis Procedure:

Poly (styrene-b-acrylic acid) is prepared by living anionic polymerization with sequence addition of styrene followed by t-butyl acrylate and hydrolysis of the t-butyl group. The scheme of the reaction is illustrated below:



### Characterization:

An aliquot of the polystyrene block was terminated before addition of t-butyl acrylate and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The hydrolysis of the tert. butyl ester to acid was followed by FT-IR spectroscopy by disappearance of characteristic absorbance at 1362cm<sup>-1</sup> of tert.butyl group.

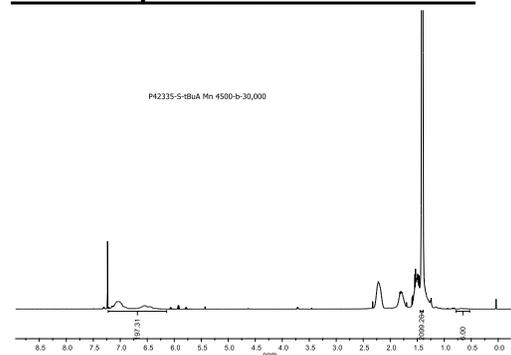
### Thermal analysis of the sample:

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<sub>g</sub>).

### Solubility:

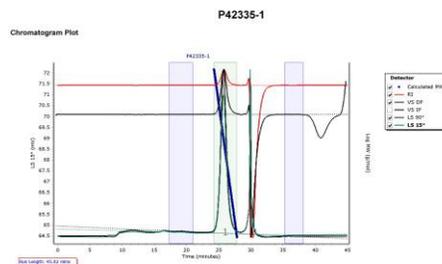
Poly (styrene-b-acrylic acid) is soluble in THF, dioxane and in methanol (depending on the compositions with a short segment of polystyrene with long segment of poly acrylic acid). The polymer is precipitated out from ether and hexane.

### <sup>1</sup>H NMR spectrum of the PS-b-tBuA:



### SEC elugram of the first (PS) block:

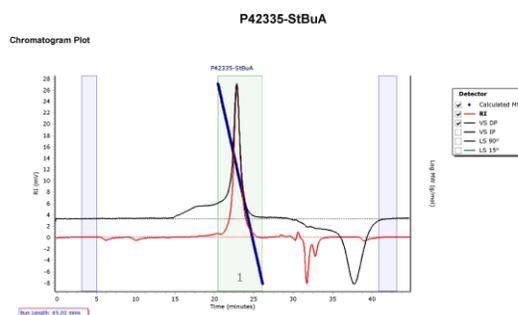
Agilent GPC/SEC Software



Molecular Weight Averages							
Peak	Mp (g/mol)	Mn (g/mol)	Mw (g/mol)	Mz (g/mol)	Mz+1 (g/mol)	Mv (g/mol)	PD
Peak 1	4792	4560	4721	4805	5005	4827	1.033

### SEC elugram of the product (diblock copolymer):

Agilent GPC/SEC Software



Molecular Weight Averages							
Peak	Mp (g/mol)	Mn (g/mol)	Mw (g/mol)	Mz (g/mol)	Mz+1 (g/mol)	Mv (g/mol)	PD
Peak 1	31539	30487	31576	32735	34045	32662	1.036