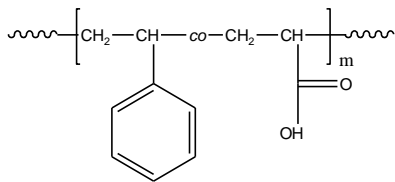


**Sample Name:**

Random Copolymer Poly(styrene-co-acrylic acid)

**Sample #:** P7048A-SAAran

**Structure:****Composition:**

PS (mol%) : 63

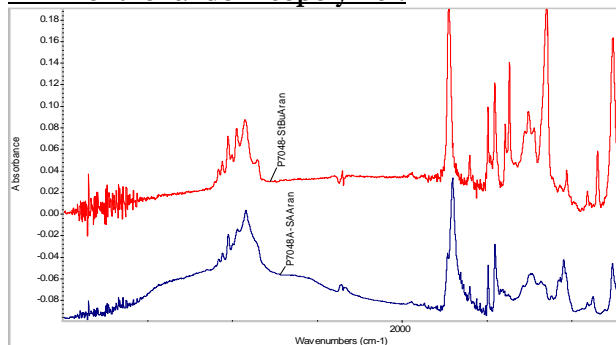
Mn x 10 <sup>3</sup> PS-co-PAA	PDI
41.3	1.9
T <sub>g</sub> for the random copolymer	132°C

**Synthesis Procedure:**

Random copolymer poly(styrene-co-acrylic acid) is prepared by radical polymerization of styrene and t-butyl acrylate, followed by hydrolyzing the poly(styrene-co-t-butyl acrylate).

**Characterization:**

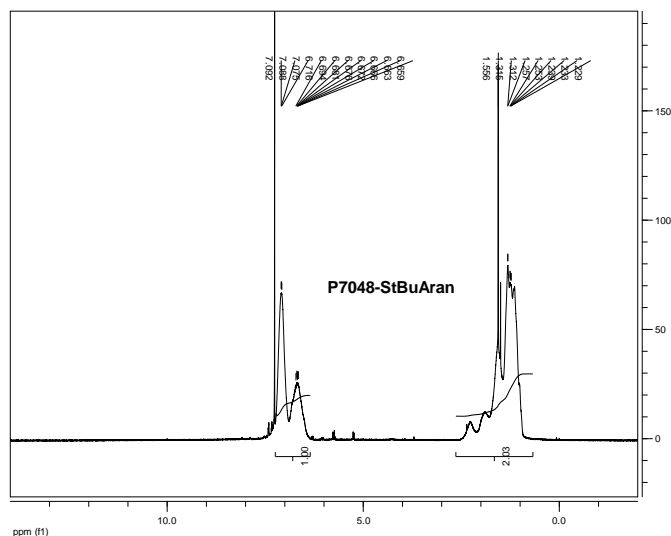
The molecular weight and polydispersity index (PDI) were calculated from the starting polymer poly(styrene-co-t-butyl acrylate). The copolymer composition was calculated from <sup>1</sup>H-NMR spectroscopy by comparing the peak area the aromatic protons of styrene at about 6.66-7.05 ppm with the protons of t-butyl acrylate at about 0.8-2.5 ppm that deducts the contribution of the styrene back bone protons according to the poly(styrene-co-t-butyl acrylate). FTIR spectra proved the formation of poly(styrene-co-acrylic acid).

**FTIR of the random copolymer:****Thermal analysis:**

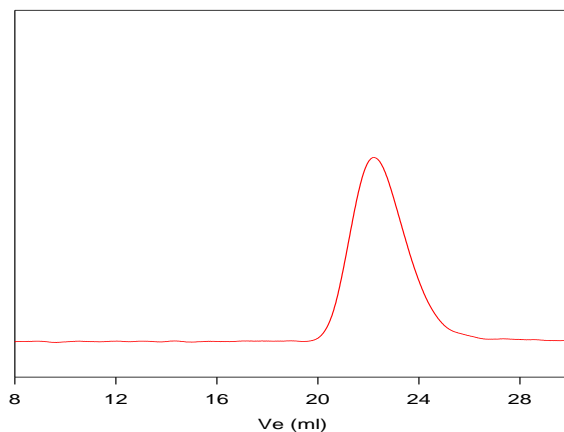
Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 20°C/min. The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T<sub>g</sub>).

**Solubility:**

Random copolymer poly(styrene-co-acrylic acid) is soluble in THF, DMF, dioxane and precipitated out from hexane.

**<sup>1</sup>H-NMR Spectrum of the random copolymer before hydrolysis:****SEC of the random copolymer before hydrolysis:**

**P7048-StBuAran**



Size exclusion chromatograph of random copolymer: poly(S-co-t-BuA):

M<sub>n</sub>=50600, M<sub>w</sub>=98300, M<sub>w</sub>/M<sub>n</sub>=1.9

after hydrolysis, random copolymer poly(S-co-AA)

M<sub>n</sub>=41300, M<sub>w</sub>=78400, M<sub>w</sub>/M<sub>n</sub>=1.9

Polystyrene content: 63%mol by NMR

**DSC thermogram for the sample:**