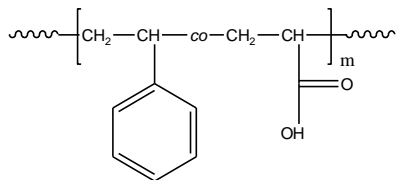


Sample Name:

Random Copolymer Poly(styrene-co-acrylic acid)

Sample #: P7044A-SAAran**Structure:****Composition:**

PS (mol%) : 55

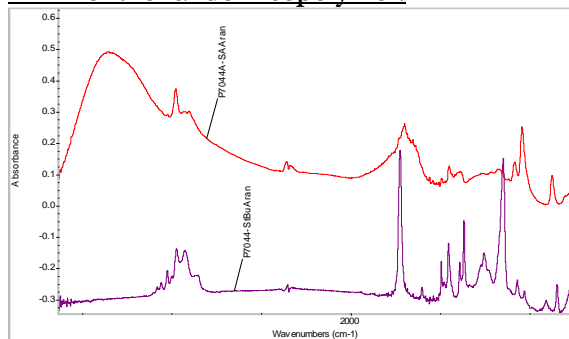
Mn x 10 ³ PS-co-PAA	PDI
18.0	2.1
T _g for the random copolymer	116°C

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:

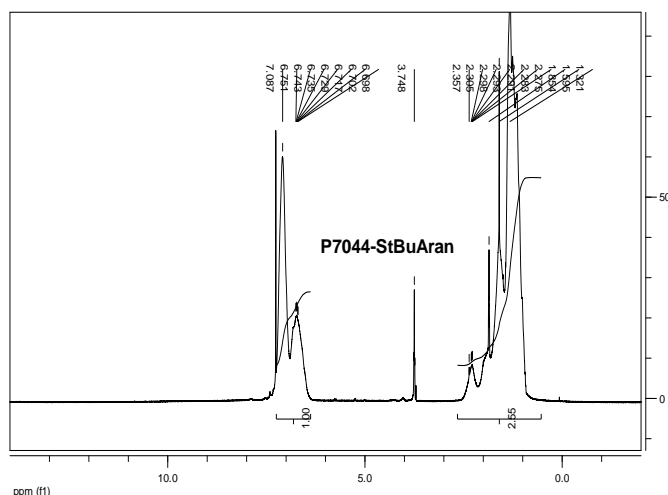
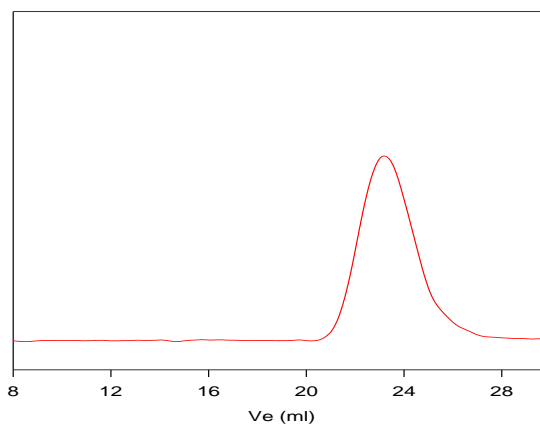
The molecular weight and polydispersity index (PDI) were calculated from the starting polymer poly(styrene-co-t-butyl acrylate). The copolymer composition was calculated from ¹H-NMR spectroscopy by comparing the peak area the aromatic protons of styrene at about 6.66-7.05 ppm with the protons of t-butyl 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_g).

Solubility:

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

¹H-NMR spectrum of the random copolymer before hydrolysis:**SEC of the random copolymer before hydrolysis:****P7044-StBuAran**

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

M_n=23000, M_w=48600, M_w/M_n=2.1

After hydrolysis, poly(S-co-AA)

M_n=18000, M_w=37800, M_w/M_n=2.1

Polystyrene content: 55% by NMR

DSC thermogram for the sample: