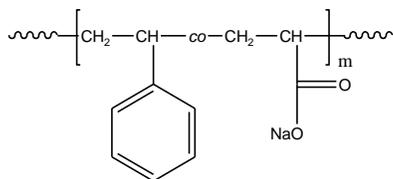


Sample Name:

Random Copolymer Poly(styrene-co-sodium acrylate)

Sample #: P7044B-SANaran

Structure:



Composition:

PS (mol%) : 55

$M_n \times 10^3$ PS-co-PANa	PDI
19.9	2.1
T_g for the random copolymer	245°C

Synthesis Procedure:

Random copolymer poly(styrene-co-sodium acrylate) is prepared by radical polymerization of styrene and t-butyl acrylate, followed by hydrolyzing the poly(styrene-co-t-butyl acrylate), and then processed by sodium hydroxide.

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 $^1\text{H-NMR}$ 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).

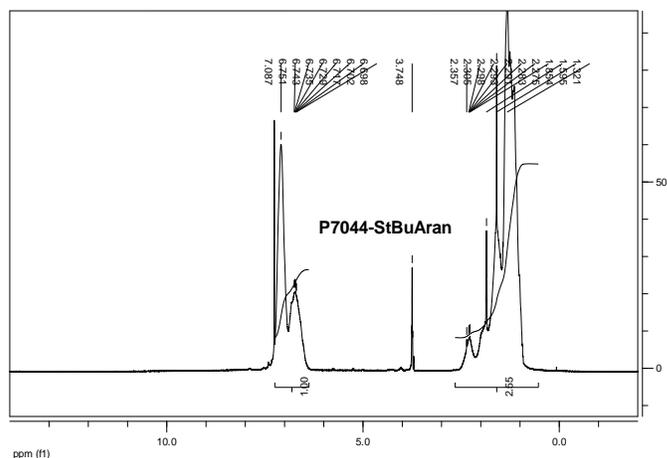
Thermal analysis:

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:

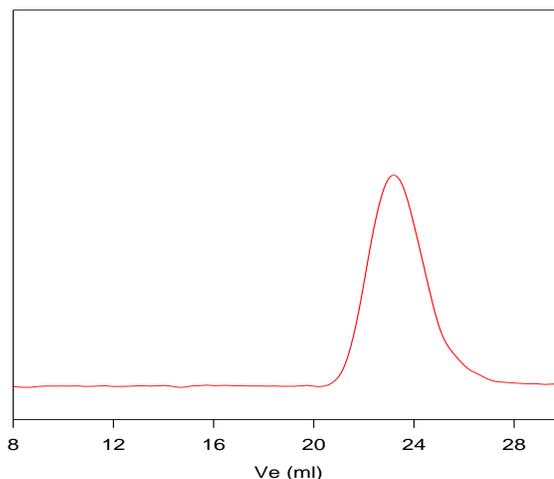
Random copolymer poly(styrene-co-sodium acrylate) is insoluble in most of the solvent, swelling in water.

$^1\text{H-NMR}$ 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 formation of, poly(S-co-ANa)
 $M_n=19900$, $M_w=41900$, $M_w/M_n=2.1$
Polystyrene content: 55% by NMR

DSC thermogram for the sample:

