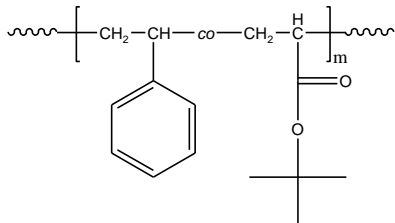


### Sample Name:

Random Copolymer Poly(styrene-co-t-butyl acrylate)

### Sample #: P7044-StBuAran

#### Structure:



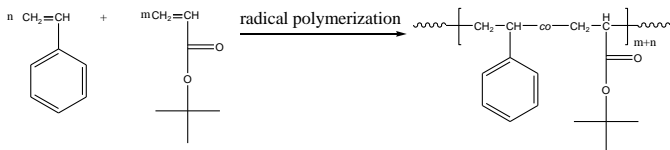
#### Composition:

PS (mol%) : 55

$M_n \times 10^3$ PS-co-PtBuA (k)	PDI
23.0	2.1
$T_g$ for the random copolymer	74°C

#### Synthesis Procedure:

Random Copolymer poly(styrene-co-t-butyl acrylate) is prepared by radical polymerization of styrene and t-butyl acrylate. The scheme of the reaction is illustrated below:



#### Characterization:

The polymer was analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). 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.

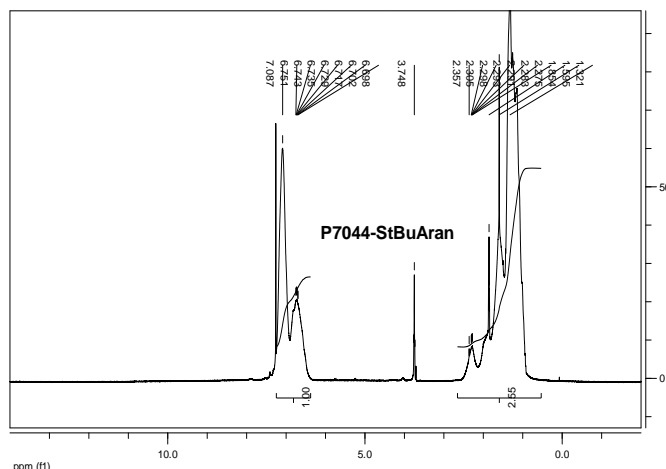
#### Thermal analysis:

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:

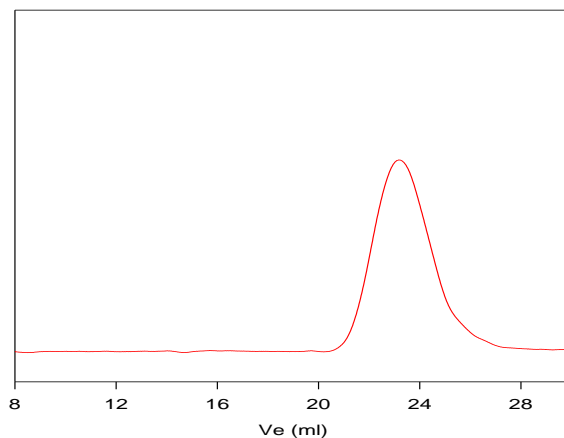
Random Copolymer poly(styrene-co-t-butyl acrylate) is soluble in  $\text{CHCl}_3$ , THF, DMF, toluene and precipitated out from methanol and water.

### $^1\text{H-NMR}$ Spectrum of the random copolymer:



### SEC of the random copolymer:

#### P7044-StBuAran



Size exclusion chromatograph of random copolymer: poly(S-co-t-BuA):  
 $M_n=23000$ ,  $M_w=48600$ ,  $M_w/M_n=2.1$   
Polystyrene content: 55%mol by NMR

### DSC thermogram for the sample:

