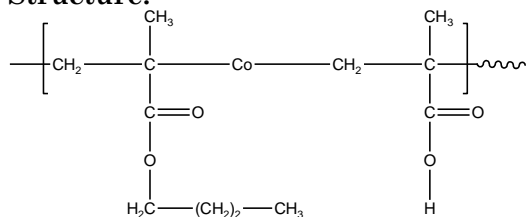


### Sample Name:

Random Copolymer Poly(n-Butyl methacrylate-co-methacrylic acid)

Sample #: P5784A-nBuMAMAA ran

### Structure:



### Composition: PMAA : 50%

Mw × 10 <sup>3</sup> (Mn) PnBuMA-co-MAA	PDI
562 (433.0)	1.3
T <sub>g</sub> of random polymer nBuMA <sub>t</sub> BuMA <sub>r</sub> an	100 °C
T <sub>g</sub> of random polymer nBuMAMAA <sub>r</sub> an	159 °C
nBuMA:tert.BuMA	45:55
Tacticity of the polymer Syndio:hetero:iso fractions	67:27:6

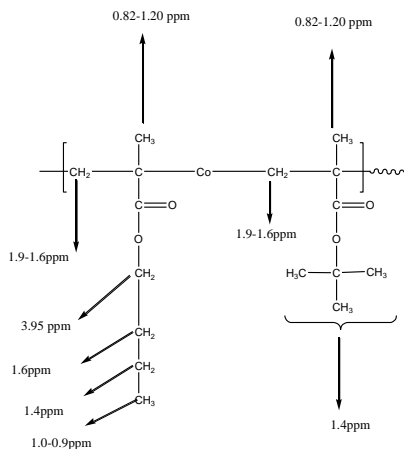
% of PMAA in the copolymer by titration  
(3.27ml of 0.1021N NaOH for 50mg of polymer)

### Synthesis Procedure:

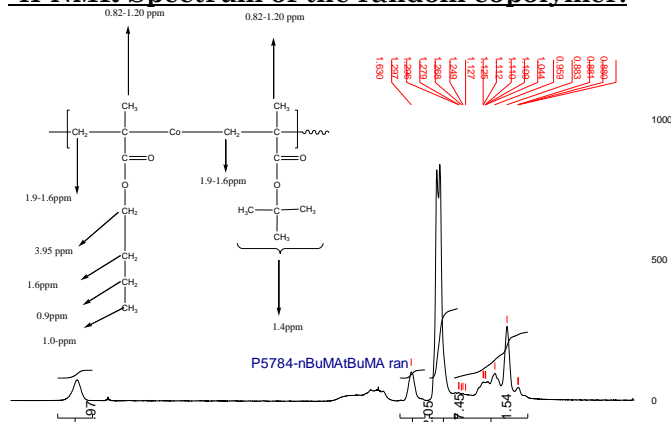
Random Copolymer Poly(n-Butylmethacrylate-co-tert.butyl methacrylate) is prepared by anionic polymerization. The product was hydrolysed in dioxane to convert poly tert.BuMA fraction to methacrylic acid.

### 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 <sup>1</sup>H-NMR spectroscopy by comparing the peak area of the protons of methylene (-CH<sub>2</sub>) of nBuMA at 4ppm and tert.butyl of tert.BuMA at about 1.4 ppm.

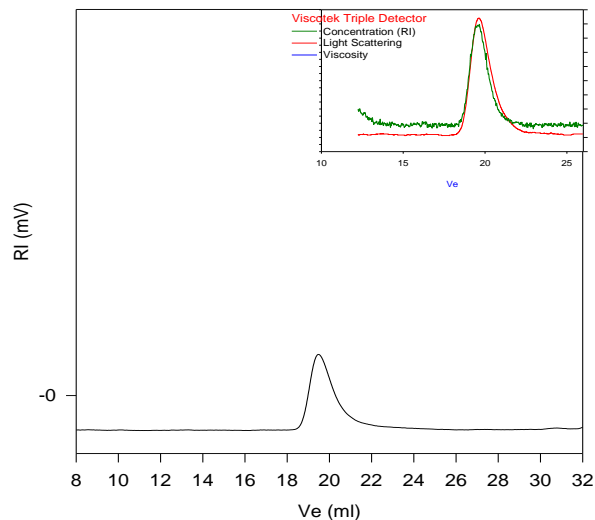


### <sup>1</sup>H-NMR Spectrum of the random copolymer:



### SEC of the random copolymer:

P5784-nBuMA<sub>t</sub>BuMA<sub>r</sub>an



### Size Exclusion Chromatography of Copolymer:

— M<sub>n</sub> = 540,000, M<sub>w</sub> = 702,000, M<sub>w</sub>/M<sub>n</sub> = 1.30  
Solution Viscosity in THF at 35 °C: 1.720dl/g  
dn/dc in THF at 35 °C: 0.084 ml/g  
R<sub>g</sub>w: 32.20nm  
After the hydrolysis of tert.butyl ester:  
M<sub>w</sub>: 562 ,000 M<sub>n</sub>: 433,00 M<sub>w</sub>/M<sub>n</sub> 1.3

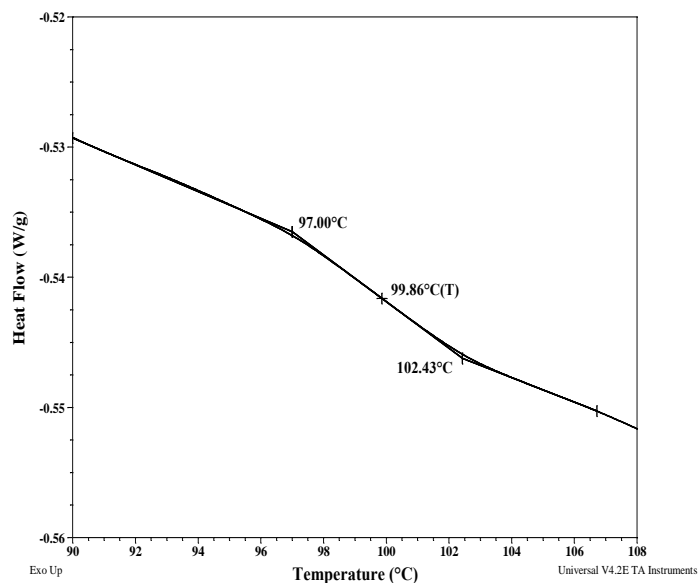
### Solubility:

CHCl <sub>3</sub>	insoluble
THF	insoluble (swell slightly)
Methanol	Soluble
DMF	Soluble

## Thermal analysis:

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 ( $T_g$ ).

## Thermograms for random polymer nBuMAAtBuMAran:



## Thermograms for random polymer nBuMAMAAran:

