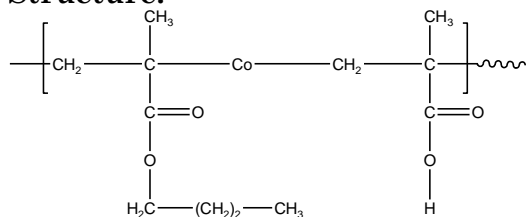


### Sample Name:

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

**Sample #: P5783C-nBuMAMAA ran**

### Structure:



### Composition: PMAA : 55% By titration

Mw × 10 <sup>3</sup> (Mn) PnBuMA-co-MAA	PDI
92 (78.0)	1.18
T <sub>g</sub> of random polymer nBuMAAtBuMAran	82 °C
T <sub>g</sub> of random polymer nBuMAMAAran	216 °C
nBuMA:tert.BuMA	45:55
Tacticity of the polymer Syndio:hetero:iso fractions	67:27:6

### % of PMAA in the copolymer by titration

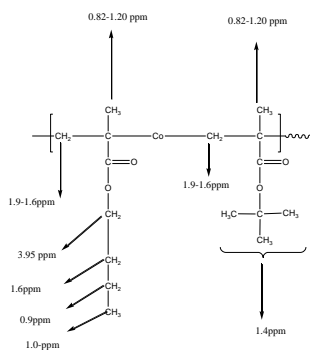
**(0.1021N NaOH 3510 micro L for 56mg of polymer)**

### 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.

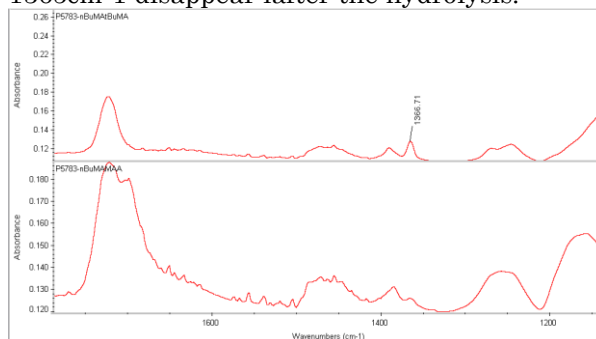


### Solubility:

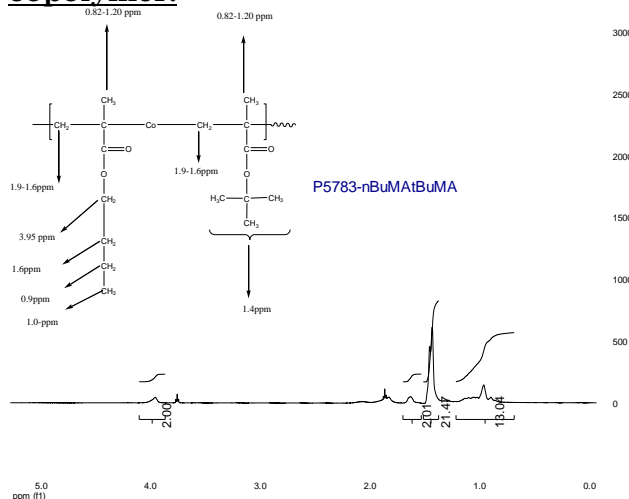
CHCl <sub>3</sub>	insoluble
THF	soluble in Hot or swell
Methanol	Soluble in Hot
DMF	Soluble

### FTIR of the polymer:

It is interesting to note that the C=O (ester) in the rich Poly tert.butyl methacrylate shifts from 1730cm<sup>-1</sup> in case of Poly n-butylmethacrylate rich polymer to 1724cm<sup>-1</sup> in the poly tert-butyl methacrylate rich polymer. The tert.butyl ester at 1365cm<sup>-1</sup> disappear iafter the hydrolysis.

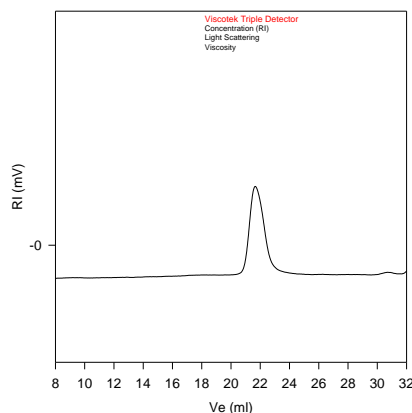


### <sup>1</sup>H-NMR Spectrum of the random copolymer:



### SEC of the random copolymer:

**P5783B-nBuMAAtBuMAran**



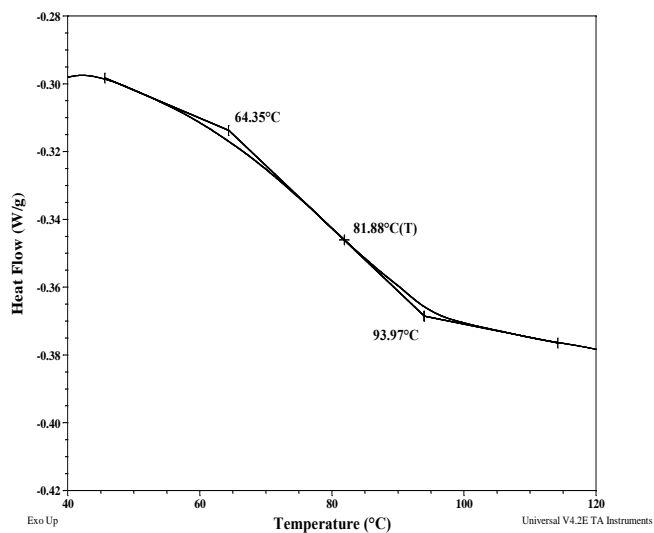
Size Exclusion Chromatography of Copolymer:

— M<sub>n</sub> = 113,000, M<sub>w</sub> = 133,000, M<sub>w</sub>/M<sub>n</sub> = 1.18  
Solution Viscosity in THF at 35 °C: 2.526dL/g  
dn/dc in THF at 35 °C: 0.084 mL/g  
After Hydrolysis of tert.butyl ester  
Mw: 92,000 Mn 78,000 Mw/Mn 1.18

## 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:

