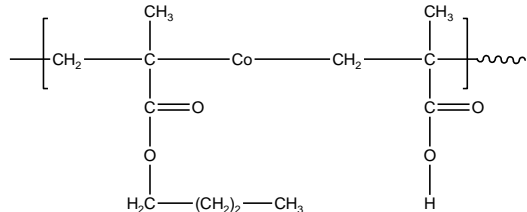## Sample Name:
Random Copolymer Poly(n-Butyl methacrylate-co-methacrylic acid)
Sample #: P5776A-nBuMAMAA ran

Structure:

Composition: PMAA 10% by titration

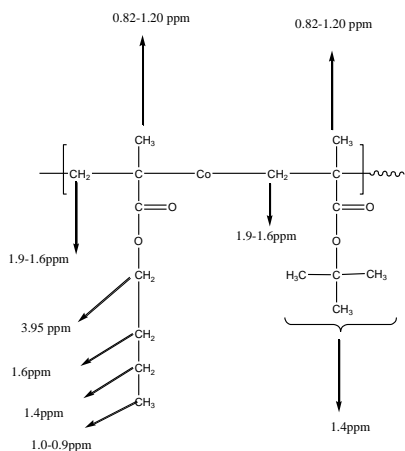| Mw × 10³ (Mn) PnBuMA-co-MAA	PDI
384(320)	1.20
T_g of random polymer nBuMAtBuMAran	45 °C
T_g of random polymer nBuMAMAAAran	65 °C
nBuMA:tert.BuMA	80:20
Tacticity of the polymer Syndio:hetero:iso fractions	77:21:2

% of PMAA in the copolymer by titration 10.0% (0.1021N NaOH 660 micro L for 50mg of polymer)
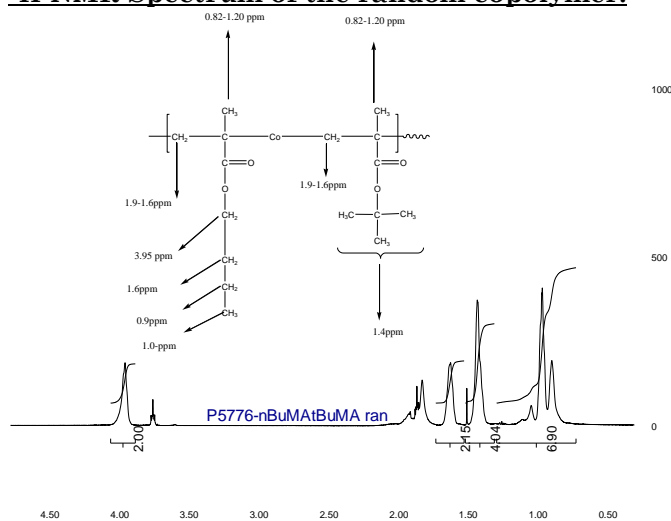
Synthesis Procedure:
Random Copolymer Poly(n-Butylmethacrylate-co-tert.butyl methacrylate) is prepared by anionic polymerization. The product was hydrolysed in dioxane to convert poly tert.BuMA fraction to methacrylic acid.
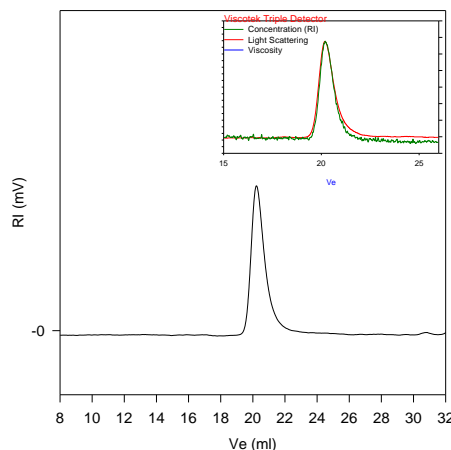
Characterization:
The polymer was analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The copolymer composition was calculated from ¹H-NMR spectroscopy by comparing the peak area of the protons of methylene (-CH2) of nBuMA at 4ppm and tert.butyl of tert.BuMA at about 1.4 ppm.
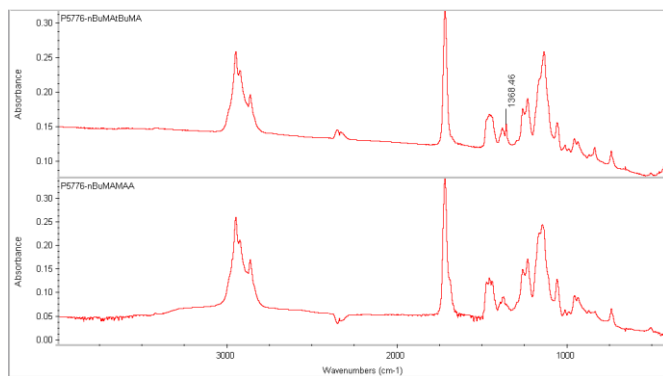

Solubility:

CHCl₃	swell
THF	Soluble
Methanol	Insoluble
DMF	Soluble

¹H-NMR Spectrum of the random copolymer:

SEC of the random copolymer:
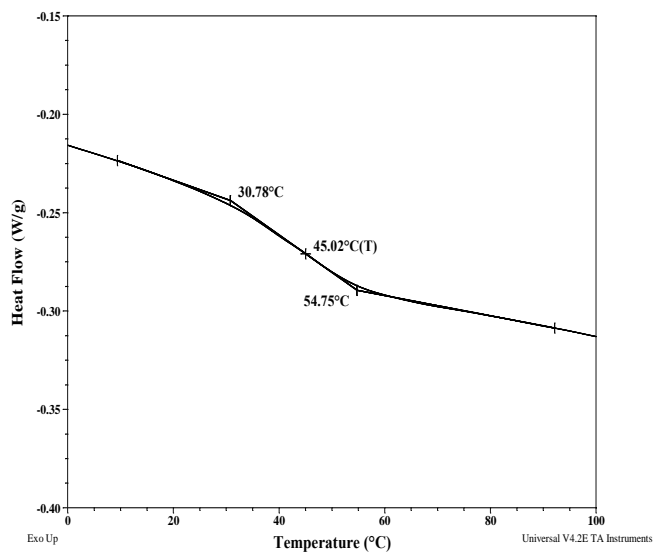
P5776-nBuMAtBuMAran

Size Exclusion Chromatography of Copolymer:
M_n = 340,000, M_w = 408,000, M_w/M_n = 1.2
Solution Viscosity in THF at 35 oC: 1.517dl/g
dn/dcin THF at 35 oC: 0.084 ml/g
Rgw: 25.94nm

FTIR Spectrum of the Polymer

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 nBuMAtBuMAran:

Thermograms for random polymer nBuMAMAAran: