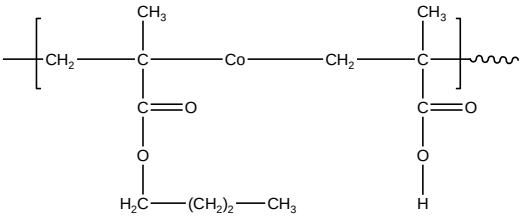
**Sample Name:**
**Random Copolymer Poly(n-Butyl methacrylate-co-methacrylic acid)**
**Sample #: P5793A-nBuMAMAA ran**

**Structure:**



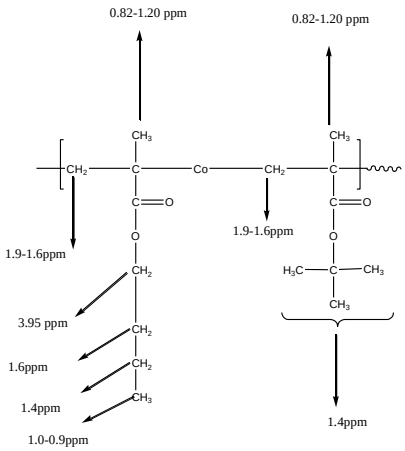
**Composition: PMAA 12% by titration**

| Mn × $10^3$ PnBuMA-co-MAA | PDI |
|---|---|
| 586.0 | 1.5 |
| $T_g$ of random polymer nBuMAtBuMAran | 40 °C |
| $T_g$ of random polymer nBuMAMAAAran | 44 °C |
| nBuMA:tert.BuMA | 70:30 |
| Tacticity of the polymer Syndio:hetero:iso fractions | 67:27:6 |

**% of PMAA in the copolymer by titration 12.0%**
**(0.1021N NaOH 780 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.

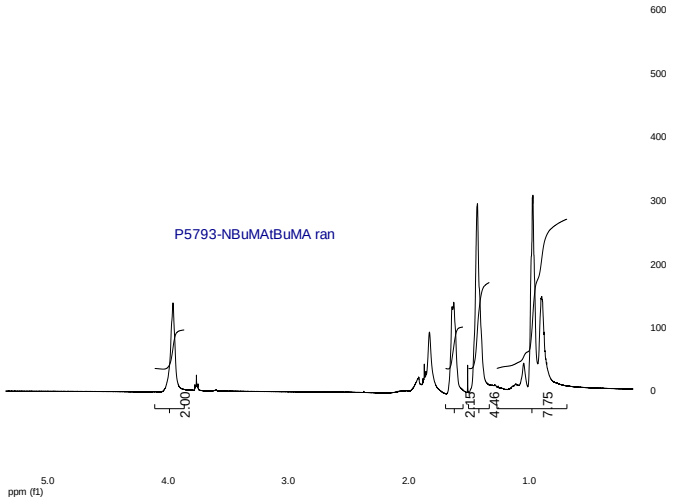
**Characterization:**
The polymer was analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The copolymer composition was calculated from $^1$H-NMR spectroscopy by comparing the peak area of the protons of methylene (-CH2) of nBuMA at 4ppm and tert.butyl of tert.BuMA at about 1.4 ppm.



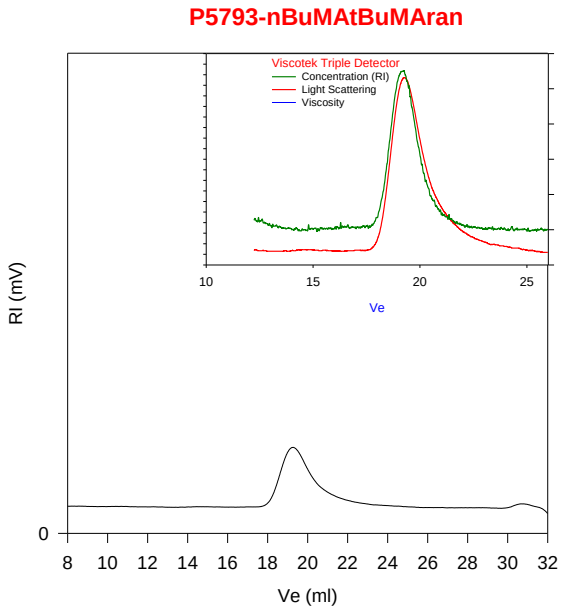

**Solubility:**

| | |
|---|---|
| $CHCl_3$ | swell |
| THF | Soluble |
| Methanol | Insoluble |
| DMF | Soluble |
| Dioxane | Soluble |

**$^1$H-NMR Spectrum of the random copolymer:**




**SEC of the random copolymer:**

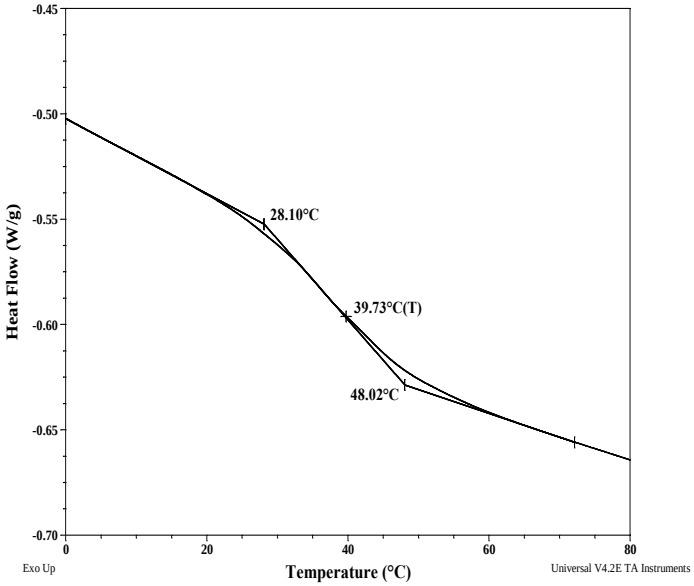



Size Exclusion Chromatography of Copolymer:
$M_n$ = 610,000, $M_w$ = 915,000, $M_w/M_n$ = 1.5
Solution Viscosity in THF at 35 oC: 2.012dl/g
dn/dcin THF at 35 oC: 0.084 ml/g
Rgw: 37.11nm
After Hydrolysis: Mn 586,000 Mw/Mn 1.5

**Thermal analysis:**

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10$^{o}$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 nBuMAMAAAran:**