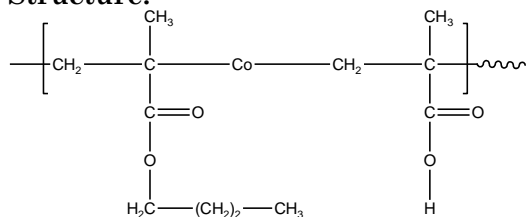


Sample Name:

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

Sample #: P5777A-nBuMAMAA ran

Structure:



Composition: PMAA 4% by titration

| Mw × 10 ³ (Mn) | PDI |
|---|---------|
| PnBuMA-co-MAA | |
| 558.0 (465.0) | 1.20 |
| T _g of random polymer nBuMA _t BuMA _r an | 42 °C |
| T _g of random polymer nBuMAMAA _r an | 46 °C |
| nBuMA:tert.BuMA | 90:10 |
| Tacticity of the polymer Syndio:hetero:iso fractions | 77:21:2 |

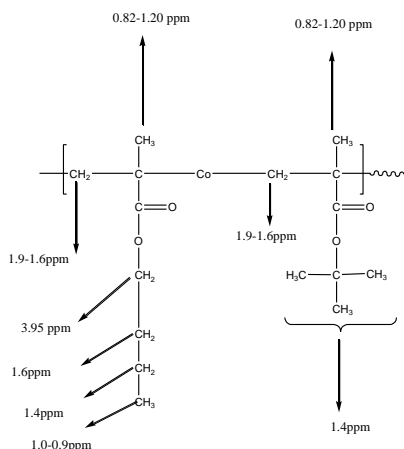
% of PMAA in the copolymer by titration 4.0%
(0.1021N NaOH 230 micro L for 50mg of polymer)

Synthesis Procedure:

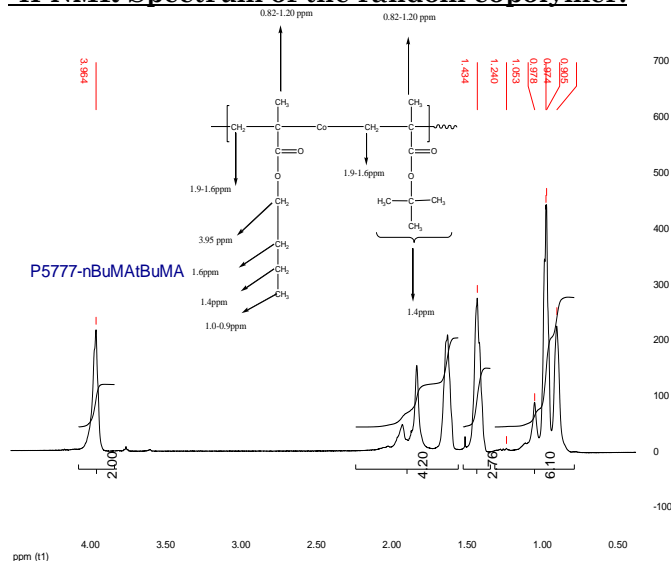
Random Copolymer Poly(n-Butylmethacrylate-co-tert.butyl methacrylate) is prepared by anionic polymerization. The product was hydrolysed in dioxane to convert poly tert.BuMA fraction to methacrylic acid.

Characterization:

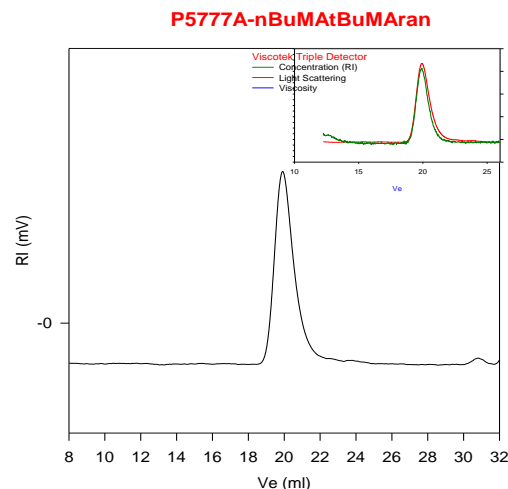
The polymer was analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The copolymer composition was calculated from ¹H-NMR spectroscopy by comparing the peak area of the protons of methylene (-CH₂) of nBuMA at 4ppm and tert.butyl of tert.BuMA at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



¹H-NMR Spectrum of the random copolymer:



SEC of the random copolymer:



Size Exclusion Chromatography of Copolymer:

M_n = 480,000, M_w = 576,000, M_w/M_n = 1.20
Solution Viscosity in THF at 35 °C: 1.468 dl/g
dn/dc in THF at 35 °C: 0.084 ml/g
R_{gw}: 28.90 nm
After Hydrolysis of tert.butyl ester to methacrylic acid:
Mw: 558,000 Mn: 465,000 Mw/Mn 1.20

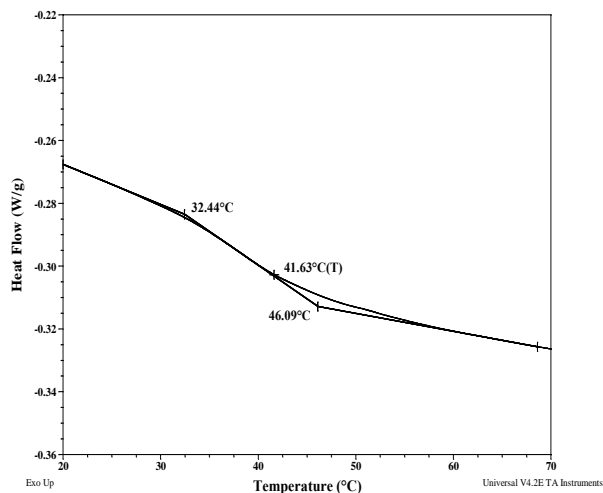
Solubility:

| | |
|-------------------|-----------|
| CHCl ₃ | swell |
| THF | Soluble |
| Methanol | Insoluble |
| 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:

