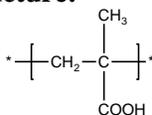


Sample Name:

Poly(methacrylic acid) rich in syndiotactic or isotactic contents

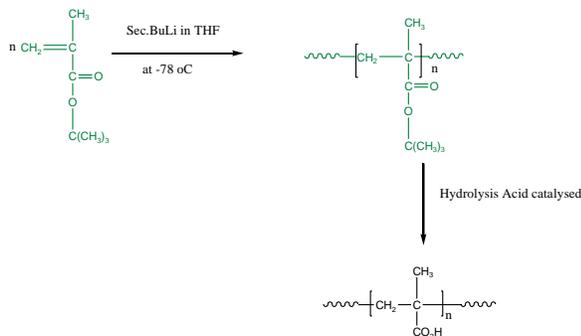
Sample #: P4416-MAA (rich in syndio contents)

Structure:**Composition:**

$M_n \times 10^3$	PDI
1.1	1.2

Synthesis Procedure:

Poly(methacrylic acid) is synthesized by living anionic polymerization of t-butyl methacrylate followed by hydrolysis of the t-butyl group. The reaction scheme is shown below.

**Characterization:**

The molecular weight and polydispersity index (PDI) of Poly(methacrylic acid) are obtained by size exclusion chromatography based on its precursor in the ester form.

Hydrolysis: The removal of tert.butyl ester moiety to COOH was checked by their FTIR, disappearance of characteristics at 1365cm^{-1} .

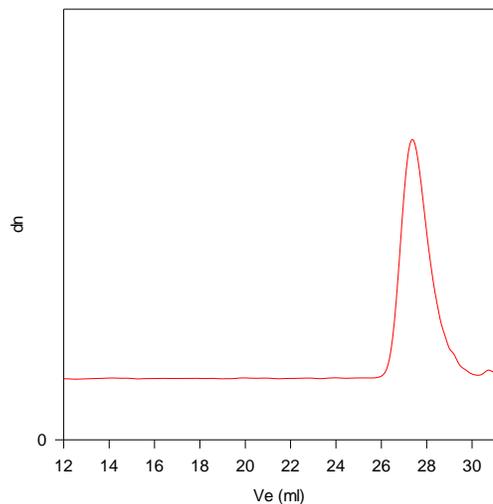
Thermal analysis:

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of $10^\circ\text{C}/\text{min}$. 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).

Solubility: Polymer is soluble in methanol and ethanol.

SEC of Homopolymer:

**P4416-tBuMA
(precursor of P4416-MAA)**



Size Exclusion Chromatography of Poly(t-butyl methacrylate)

$M_n=1800$, $M_w=2200$ PI=1.20

Poly(methacrylic acid): $M_n=1100$ PI=1.20

References:

S. K. Varshney, Z. Gao, Xing Fu Zhong, A. Eisenberg "Effect of Lithium Chloride on the "Living" Polymerization of tert-Butylmethacrylate and Polymer Microstructure Using Monofunctional Initiators" *Macromolecules*, 1994, 27, 1076.