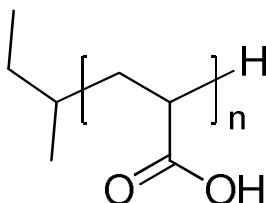


Sample Name: Poly(acrylic acid)

Sample # P4569-AA

Structure:

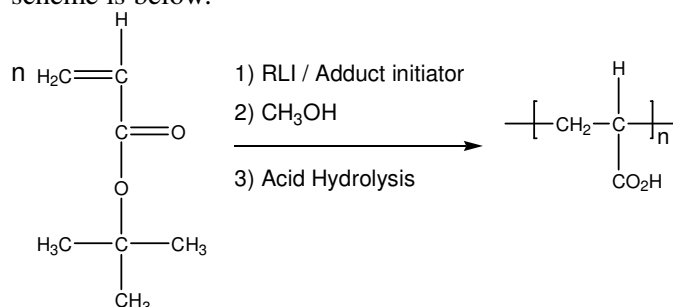


Composition:

Mn x 10 ³	PDI
3.4	1.3

Synthesis Procedure:

Poly(acrylic acid) was synthesized by anionic polymerization of t-butyl acrylate followed by hydrolysis of the tert-butyl group. The reaction scheme is below.



Characterization:

The molecular weight and polydispersity index (PDI) are obtained by size exclusion chromatography (SEC) in THF. SEC analysis was performed on a Varian liquid chromatograph equipped with refractive and UV light scattering detectors. Three SEC columns from Supelco (G6000-4000-2000 HXL) were used with triple detectors from Viscotek Co.

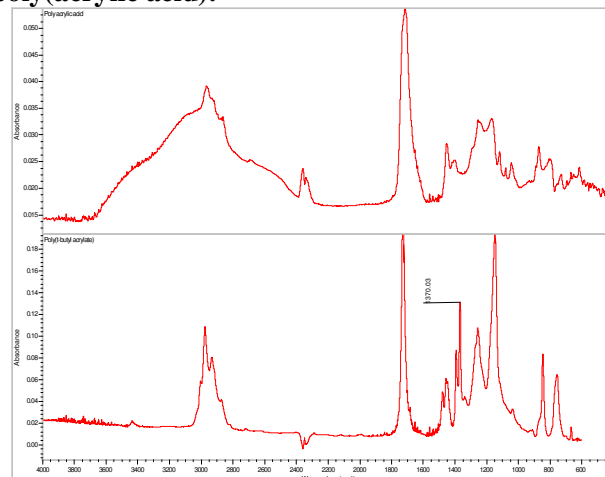
Hydrolysis:

The quantitative hydrolysis of the ester is confirmed by the disappearance of tert.butyl ester absorbance at around 1370cm⁻¹.

Solubility:

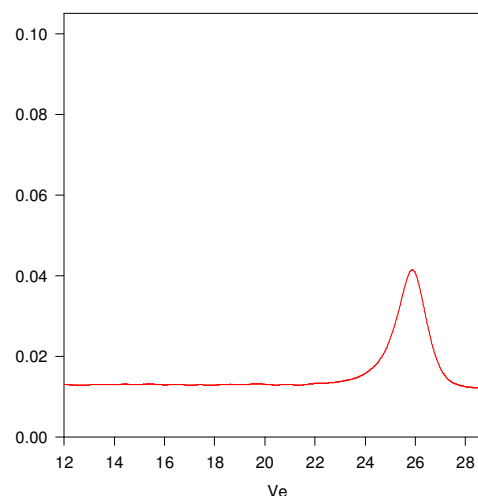
Poly(acrylic acid) is soluble in THF, water, methanol, ethanol. The polymer precipitates from ether, acetone, and hexane.

FTIR spectra of poly(tert-butyl acrylate) and poly(acrylic acid):



SEC elugram:

P4569-tBuA Precursor for P4569-AA



Size Exclusion Chromatography of Poly tert-butyl acrylate:

M_n=6000, M_w=7800, PI=1.3 after hydrolysis of tert.butyl ester

Polyacrylic acid: M_n=3400 M_w/M_n=1.30

References:

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- 3) Jerome, R. Forte, **S. K. Varshney**, R. Fayt, and Ph. Teyssie, "The Anionic Polymerization of Alkylacrylates: A Challenge" in the Recent Advances in Mechanistic and Synthetic Aspects of Polymerization: M. Fontanille and A. Guyot Ed., NATO ASI Series C 215, 101 (1987), CA Vol. 108, 12, 094992.
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