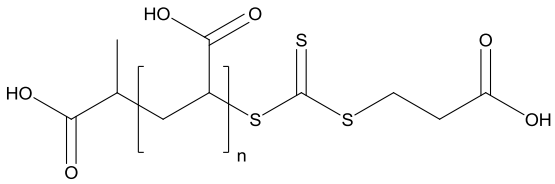
Sample Name: **Poly (acrylic acid)**

Sample #: **P16107-AA**

Structure:

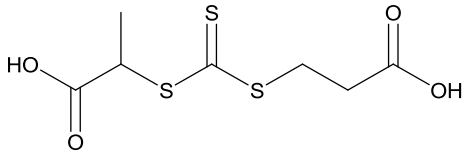


Composition:

Mn x 10^3	PDI
26.5	1.20

Synthesis Procedure:
Polyacrylic acid was synthesized by RAFT polymerization of tert-butyl acrylate using V70 as initiator and xanthate as chain transfer agent, followed by hydrolysis of tert butyl group to acid group.

The chain transfer agent used for polymerization is as follows:

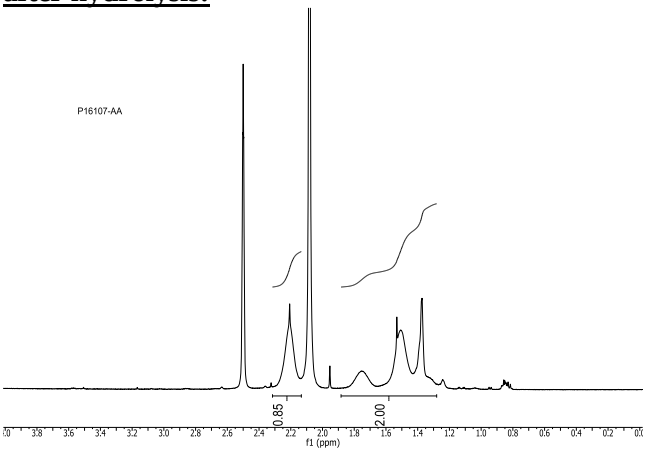


Characterization:
The molecular weight and polydispersity index (PDI) of PAA are obtained by size exclusion chromatography (SEC) of its tert butyl ester in THF and calculated accordingly.

Hydrolysis:
The quantitative conversion of the ester to acid group is confirmed by the disappearance of tert.butyl ester absorbance at 1370cm^{-1} from FTIR and NMR.

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

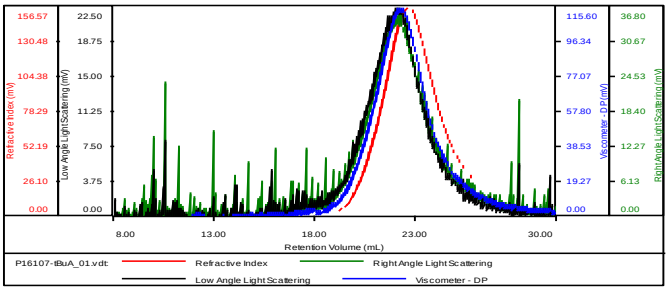
^{1}HNMR of the Poly acrylic acid in d6-DMSO after hydrolysis:



SEC of the Poly tert-butyl acrylate

Sample ID: P16107-tBuA

Concentration (mg/mL)	25.1567
Sample dn/dc (mL/g)	0.0512
Method File	PS80K-29August2016-0000.vcm
Column Set	3x PL 1113-6300
Solvent	THF



Sample	Mn (Da)	Mw (Da)	Mw/Mn	IV (dL/g)	Mp (Da)
P16107-tBuA_01.vdt	47,506	56,389	1.187	0.4204	50,743

References:

1. Ph. Teyssie, Ph. Bayard, R. Jerome, **S. K. Varshney**, and J. S. Wang, *35th IUPAC International Union of Pure & Applied Chemistry International Symposium on Macromolecules" 1994, 67.*

2. R. Fayt, R. Forte, C. Jacobs, R. Jerome, T. Ouhadi, Ph. Teyssie and **S. K. Varshney,** *Macromolecules, 1987, 20, 1442-1444.*

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. Fontanaille and A. Guyot Ed., NATO ASI Series *C 215,101 (1987), CA Vol. 108, 12, 094992.*

4. Ph. Teyssie, R. Fayt, C. Jacobs, R. Jerome, L. Leemans, and **S. K. Varshney** *Am. Chem. Soc.,Polym. Prepr. 1988, 28, 2, 52-53*