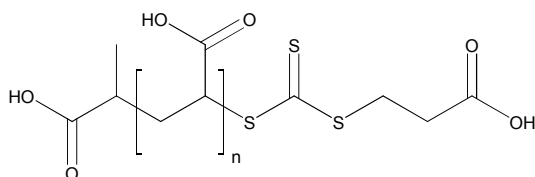


Sample Name:

**Poly(acrylic acid)** (by RAFT polymerization)

Sample #: **P14705-AA**

Structure:

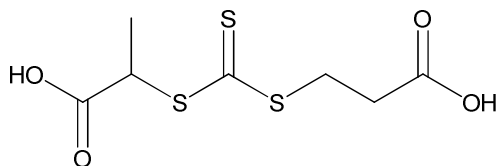


Composition:

$M_n \times 10^3$ (g/mol)	PDI
10.5	1.13

Synthesis:

Polyacrylic acid was synthesized by RAFT polymerization of acrylic acid using 2,2'-azobis isobutyrate (CAS 2589-57-3) as initiator and xanthate as chain transfer agent:

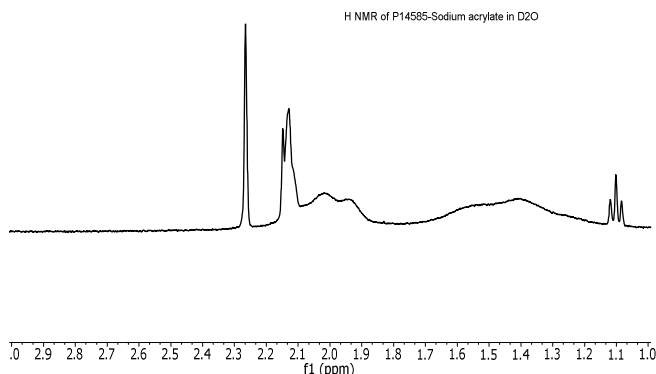
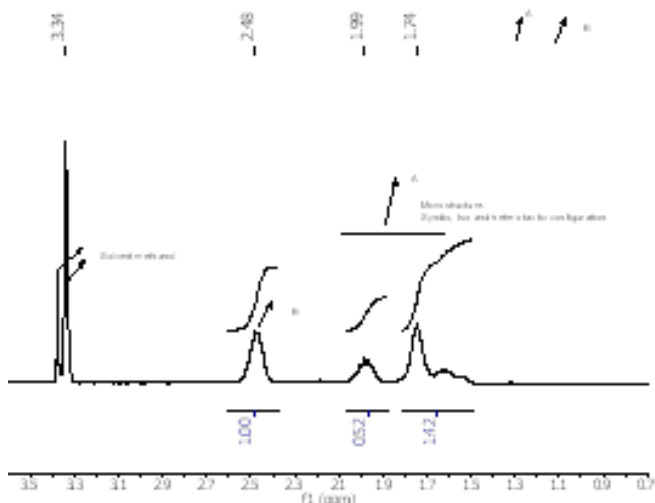


**Solubility:** Polyacrylic acid is soluble in water.

Characterization:

The molecular weight and polydispersity index (PDI) were determined by size exclusion chromatography (SEC). To calculate the molecular weight of polyacrylic acid, it was converted to its n-butyl ester form and characterized 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 dual detectors as an eluent.

$^1\text{H}$  NMR of the Polyacrylic acid in  $\text{CD}_3\text{OD}$ :

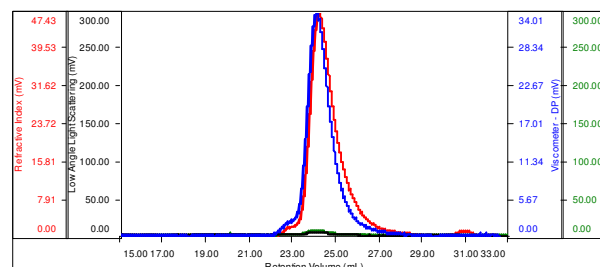


SEC:

To determine the molecular weight of PAA, it was converted to poly(n-butyl acrylate) (PnBuA). SEC was done using  $\text{H}_2\text{O}$  as an eluent in presence of aqueous buffer solution ( $\text{NaHCO}_3$  0.05 M,  $\text{NaNO}_3$  0.1 M, triethanolamine 0.02).

Sample ID: P14705-nBuA

Concentration (mg/mL)	1.9339
Sample dn/dc (mL/g)	0.0840
Method File	PS80K-March13-2014-0000.vcm
Column Set	3x PL 1113-6300
System	System 1



Sample	Mn	Mw	Mp	Mw/Mn	IV
P14705-nBuA_01.vdt	18,336	20,765	20,513	1.132	0.456

References:

- Ph. Teyssie, Ph. Bayard, R. Jerome, **S. K. Varshney**, and J. S. Wang, *35<sup>th</sup> IUPAC International Union of Pure & Applied Chemistry International Symposium on Macromolecules* 1994, 67.
- R. Fayt, R. Forte, C. Jacobs, R. Jerome, T. Ouhadi, Ph. Teyssie and **S. K. Varshney**, *Macromolecules*, 1987, 20, 1442-1444.
- 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.
- Ph. Teyssie, R. Fayt, C. Jacobs, R. Jerome, L. Leemans, and **S. K. Varshney** *Am. Chem. Soc., Polym. Prepr.* 1988, 28 (2), 52-53.