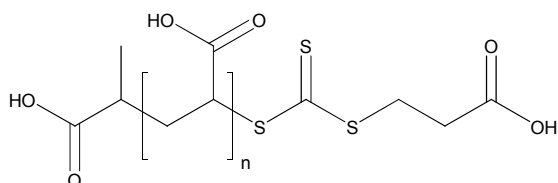


Sample Name:

Poly(acrylic acid) (by RAFT polymerization)

Sample #: **P14708-AA**

Structure:

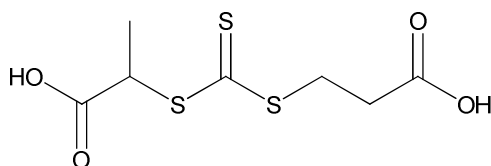


Composition:

$M_n \times 10^3$ (g/mol)	PDI
38.0	1.2

Synthesis:

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



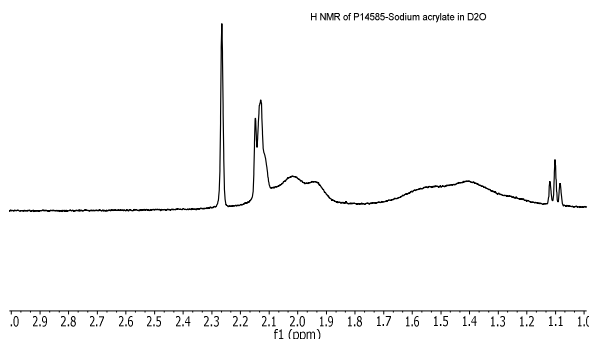
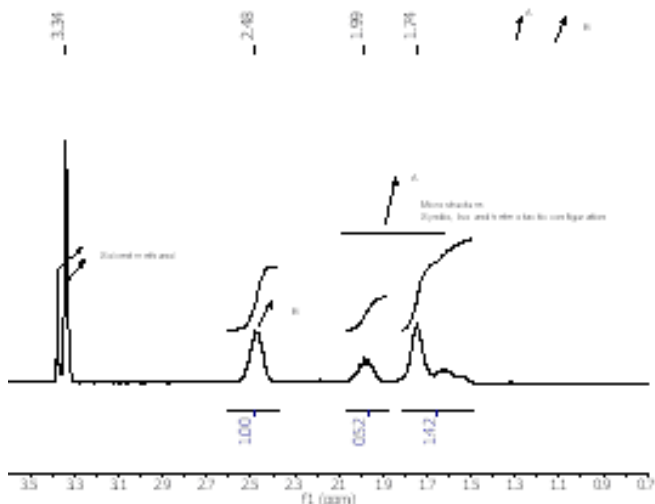
Solubility:

Polyacrylic acid is soluble in water.

Characterization:

The molecular weight and polydispersity index (PDI) were obtained by size exclusion chromatography (SEC). To determine 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 model 270 from Viscotek Co. THF was used as an eluent.

¹H NMR of the Polyacrylic acid in CD₃OD:

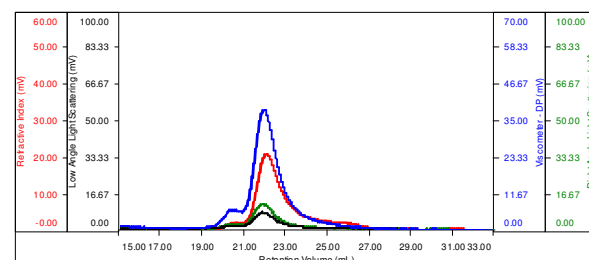


SEC:

To determine the molecular weight of PAA, it was converted to poly(n-butyl acrylate) (PnBuA). SEC was done using H₂O as an eluent in presence of aqueous buffer solution (NaHCO₃ 0.05 M, NaNO₃ 0.1 M, triethanolamine 0.02).

Sample ID: P14708A-nBuA

Concentration (mg/mL)	1.0196
Sample dn/dc (mL/g)	0.0840
Method File	PS80K-Feb25-2014-0000.vcm
Column Set	3x PL 1113-6300
System	System 1



Sample	Mn	Mw	Mp	Mw/Mn	IV
P14708-nBuA_01.vdt	67,133	80,179	82,241	1.194	1.2379

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. Fontanille 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.