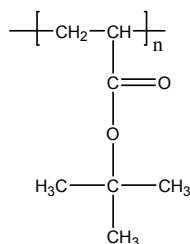


Sample Name: Poly(t-butyl acrylate)

Sample #: P8263-tBuA

**Structure:**



**Composition:**

| $M_n \times 10^3$ | PDI |
|-------------------|-----|
| 235.0             | 1.2 |

**Synthesis Procedure:**

Poly(t-butyl acrylate) is obtained by living anionic polymerization of t-butyl acrylate.<sup>1-4</sup>

**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.

Thermal analysis of the samples was carried out using a differential scanning calorimeter (TA Q100) at a heating rate of 10°C/min. The inflection glass transition temperature ( $T_g$ ) of the sample has been considered.

**Solubility:**

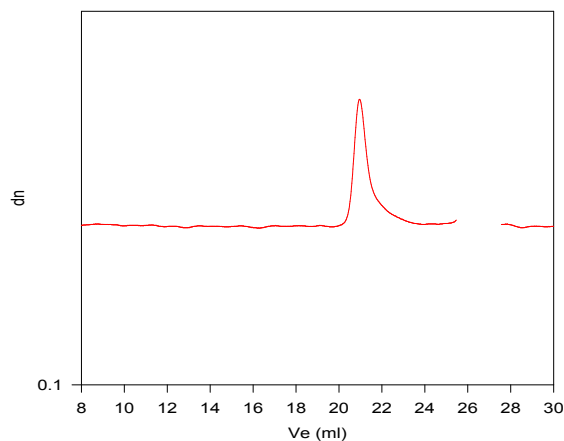
Poly(t-butyl acrylate) is soluble in THF, hexanes (low MW), toluene and  $\text{CHCl}_3$ . This polymer precipitates from ethanol and methanol containing 10-15% water.

**$T_g$  vs MW for selected poly t-butyl acrylate**

| $M_n \times 10^3$ | $T_g$ (°C) | $M_n \times 10^3$ | $T_g$ (°C) |
|-------------------|------------|-------------------|------------|
| 0.75              | -15        | 11.6              | 28         |
| 1.4               | -5         | 22                | 32         |
| 2                 | 7          | 65                | 35         |
| 4.5               | 12         | 1128              | 38         |

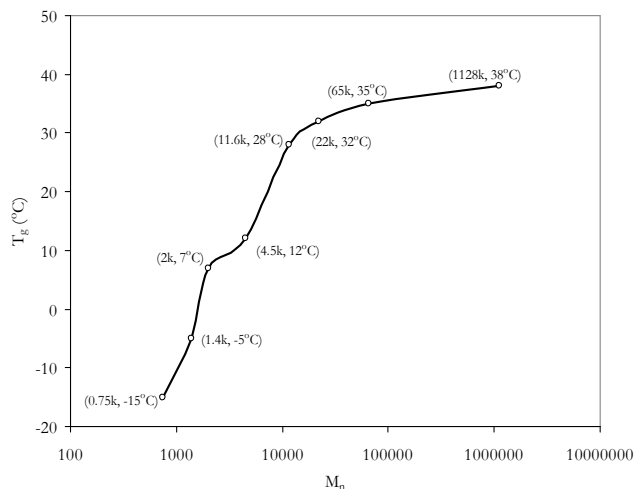
**SEC of Sample:**

**P8263-tBuA**



Size Exclusion Chromatography of Poly(n-butyl acrylate)  
 $M_n=235,000$ ,  $M_w=282,000$   $PI=1.2$   
Solution Viscosity in THF at 35 °C: 1.36dl/g  
Radius of Gyration in THF at 35 °C: 18.47nm  
dn/dc in THF at 35 °C: 0.085ml/g

**$T_g$  of poly t-butyl acrylate as function of molecular weight**



**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