

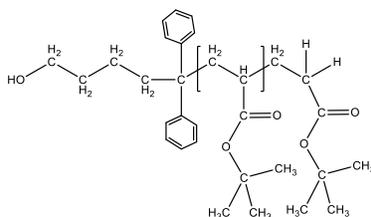
Product Profile

Identification

Product Name: POLY(TERT-BUTYL ACRYLATE), A-HYDROXY-TERMINATED

Product Lot Number: P9754AR-tBuAOH

Product Chemical Architecture:

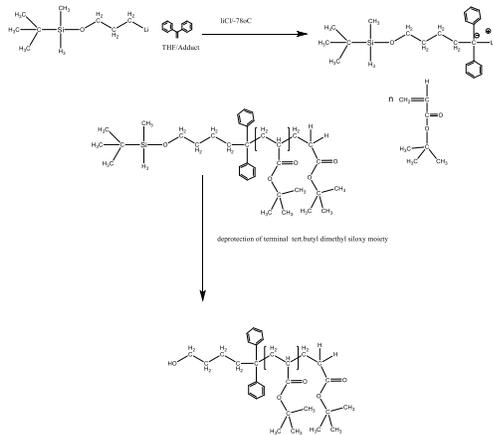


Composition:

| Mn x 10 ³ | Mw/Mn (PDI) | OH functionality% |
|--|-------------|--|
| 3.5 | 1.08 | 95 (¹ H NMR) 5 % OH protected |
| Dp – PtBuA ₂₈ from ¹ H NMR | | |

Method of Synthesis

The polymer is synthesized by anionic polymerization using Hydroxyl protected initiator sec Butyl-lithium as initiator as illustrated below.



Solubility of polymer in different solvents

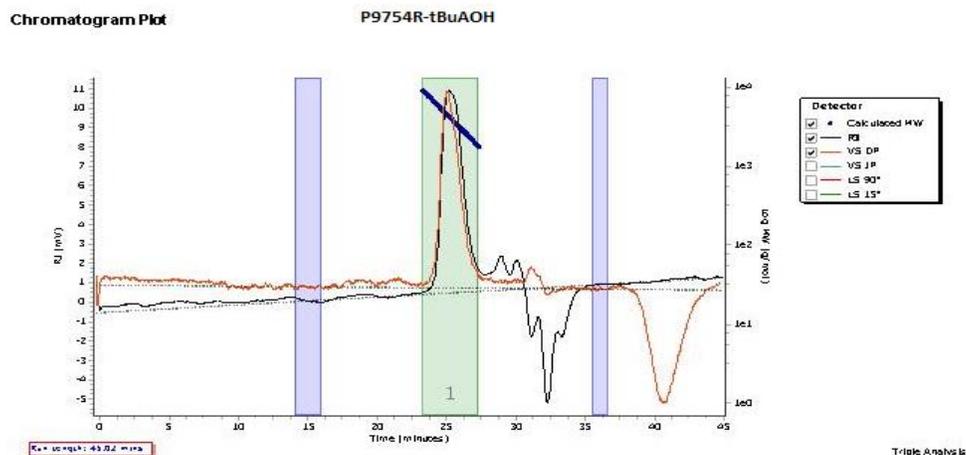
| | | | |
|-------------------|---|-------------------|----------------|
| THF | √ | Acetone | √ |
| CHCl ₃ | √ | CHCl ₃ | √ |
| Toluene-Hot | √ | Methanol-Hot | Opaque soluble |

Purification of Polymer to cleave OH protected group.

Since tert-butyl ester are sensitive for hydrolysis under acidic condition therefore the use of TFA and HCl was avoided. Perchloric acid, p-toluene sulfonic acid or (Bu)₄NF was used by dissolving polymer in toluene and added with 30 % water with one of the above-mentioned catalyst to cleave terminal OH protected tert butyl dimethyl siloxy unit. It was noticed that the cleavage is sensitive to its molecular weight.

The % of cleavage remains within 95% by stirring Toluene/water solution for over 2 weeks at 40 °C.

A. Gel Permeation Chromatography (GPC), SEC- Profile for PtBuA-OH:



Molecular Weight Averages

| Peak | Mp (g/mol) | Mn (g/mol) | Mw (g/mol) | Mz (g/mol) | Mz+1 (g/mol) | Mv (g/mol) | PD |
|--------|------------|------------|------------|------------|--------------|------------|-------|
| Peak 1 | 4260 | 3570 | 3864 | 4156 | 4443 | 4072 | 1.082 |

B. NMR (HNMR) spectrum of polymer:

