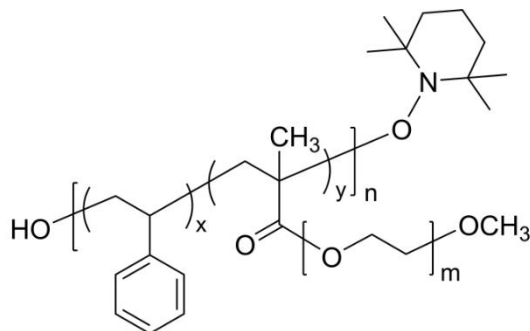Sample name:

Poly(styrene–*co*–[poly(ethylene oxide)] methacrylate), (α-hydroxy, ω-TEMPO)-terminated functionalized comblike random copolymer

Sample # **P6538-SEOMAranOHT**

Composition:

Total $M_n \times 10^3$ (g/mol)	100.8
M_w/M_n	1.23
PS : PEOMA ratio*	48 : 52 wt%
T_g	-44 °C

Average copolymer chain consists of 465 units of styrene and 47 units of PEO-methacrylate (M_n of PEO = 1,000 g/mol).

Synthesis procedure:

The polymer was prepared by TEMPO-mediated polymerization of styrene and methacrylate-terminated poly(ethylene oxide) macromonomer using hydroxy-functional alkyloxyamine as an initiator. The scheme of is presented below:
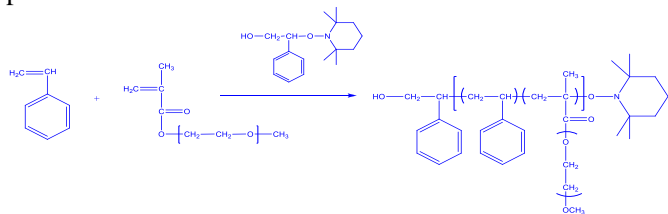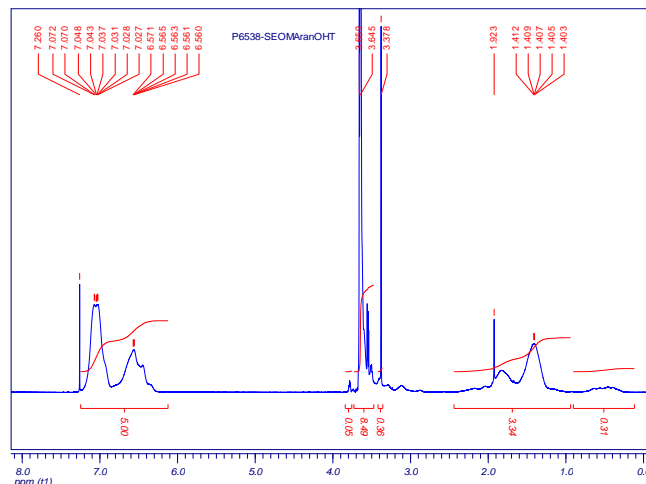

Characterization:

The molecular weight and polydispersity index (M_w/M_n) were determined by size exclusion chromatography (SEC) using light scattering data to get the <u>absolute molecular weight</u>. The chemical composition (ratio between units in copolymer) was calculated from proton NMR spectroscopy. Glass transition temperature (T_g) was measured using TA Q100 differential scanning calorimeter (DSC) at a heating rate 10 ºC/min.
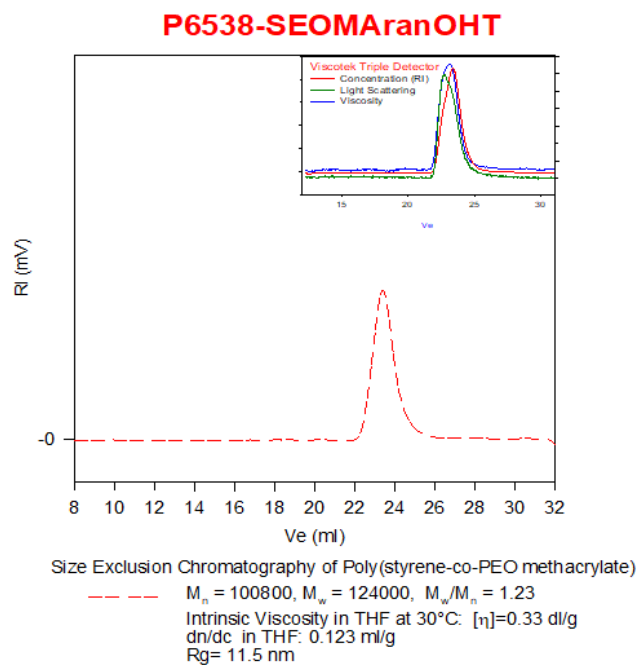
Solubility:

The polymer is soluble in tetrahydrofuran, chloroform; and

it precipitates from hexanes and ether.

¹H NMR spectrum of the product:

SEC chromatogram of the product:

Size Exclusion Chromatography of Poly(styrene-co-PEO methacrylate)

– – – – M_n = 100800, M_w = 124000, M_w/M_n = 1.23
Intrinsic Viscosity in THF at 30°C: [η]=0.33 dl/g
dn/dc in THF: 0.123 ml/g
Rg= 11.5 nm

DSC thermogram of the product:

(v. I-02)