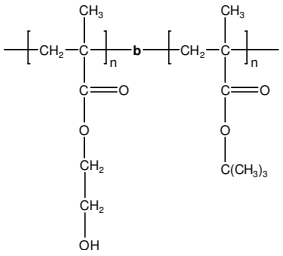
Sample Name:
Poly(2-hydroxy ethyl methacxrylate b-t-butyl methacrylate)
Sample #: **P5060-HEMAtBuMA**

Structure:

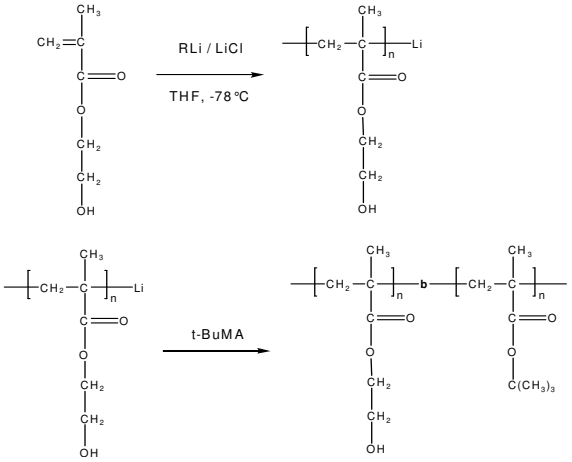


Composition:

Mn x 10^3 HEMA-tBuMA	PDI
3.0-b-148	1.12
T_g for HEMA block: Not distinct	T_g for tBuMA block:129

Synthesis Procedure:

Poly(2-hydroxy ethyl methacrylate -b- t-butyl methacrylate) is synthesized by living anionic polymerization with sequence addition of hydroxyl ethyl methacrylate followed by t-butyl methacrylate. The scheme of the reaction is illustrated below:



Characterization:

An aliquot of the anionic poly(hydroxyl ethyl methacrylate) block was terminated before addition of t-butyl methacrylate and analyzed by size exclusion chromatography (SEC) to obtain the molecular weight and polydispersity index (PDI). The final block copolymer composition was calculated from SEC result since the first block is very short.

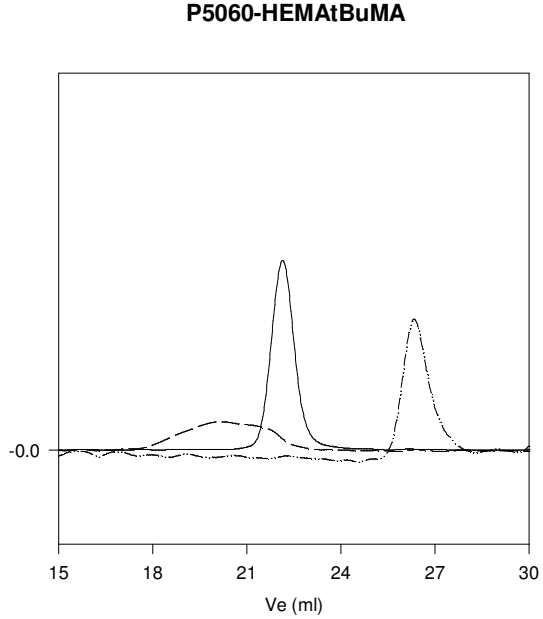
Thermal analysis

Thermal analysis of the samples was carried out on a TA Q100 differential scanning calorimeter at a heating rate of 10°C/min.The midpoint of the slope change of the heat flow plot of the second heating scan was considered as the glass transition temperature (T_g).

Solubility:

Poly(2-hydroxy ethyl methacrylate -b- t-butyl methacrylate) is soluble in is soluble in DMF, THF and $CHCl_3$ (depends upon block composition) but insoluble in water.

SEC of the block copolymer:



Size exclusion chromatography of
poly(2-Hydroxy ethylmethacrylate(protected with TMS)-b-tert.butylmethacrylate)
Poly 2 hydroxy ethyl methacrylate (protected with TMS) M_n=4800, PI=1.04
Block copolymer Mn : 2-HEMA-TMS(4800)-b-t.BuMA(148000)
Mw/Mn 1.12
Block Copolymer after deprotecting hydroxy group:
HEMA (3000)-b-Ptert.BuMA(148000), PI=1.12

Block copolymer : Block Copolymer after deprotecting hydroxy group:
Could not be eluted properly and indicate the formation of micelles in THF

DSC thermogram for the polymer: