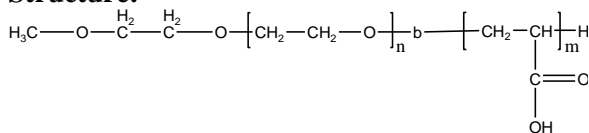


**Sample Name:** Poly (ethylene oxide -b- acrylic acid)

**Sample #:** P16279A-EOAA

**Structure:**

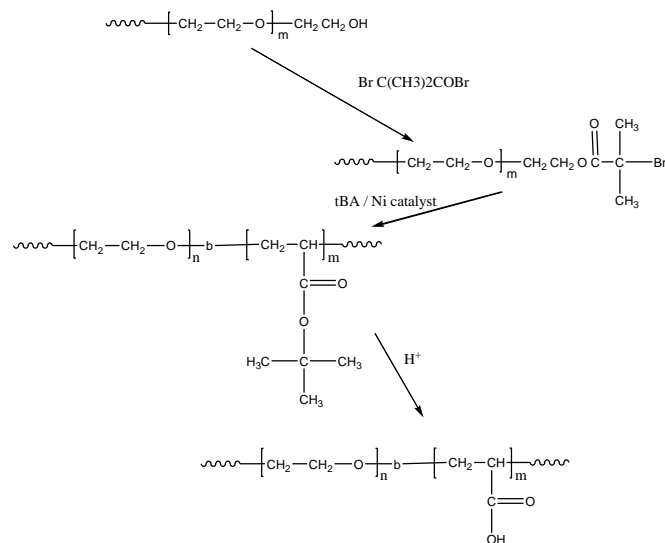


**Composition:**

$\text{Mn} \times 10^3$ PEO-b-PAA	PDI
5.0-3.2	1.10

**Synthesis Procedure:**

The polymer is prepared as following scheme:



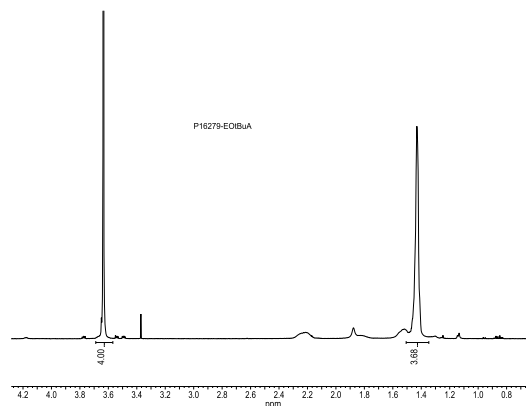
**Characterization:**

The final block copolymer composition was calculated from  $^1\text{H-NMR}$  spectroscopy of poly(ethylene oxide -b- t-butyl acrylate) by comparing the peak area of the t-butyl acrylate protons at 1.43 ppm with the peak area of the ethylene oxide protons at 3.6 ppm, then transferred to the EOAA form accordingly. Copolymer PDI is determined by SEC of poly(ethylene oxide -b- t-butyl acrylate).

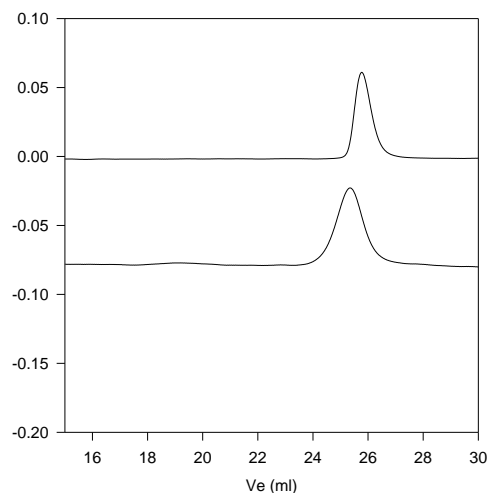
**Solubility:**

The polymer is soluble in  $\text{CHCl}_3$ , methanol, THF and precipitated out from cold hexane or ether.

**$^1\text{H-NMR}$  Spectrum of the block copolymer before hydrolysis:**



**SEC of the block copolymer before hydrolysis:**  
EOtBuA precursor for P16279A-EOAA



Size exclusion chromatography:

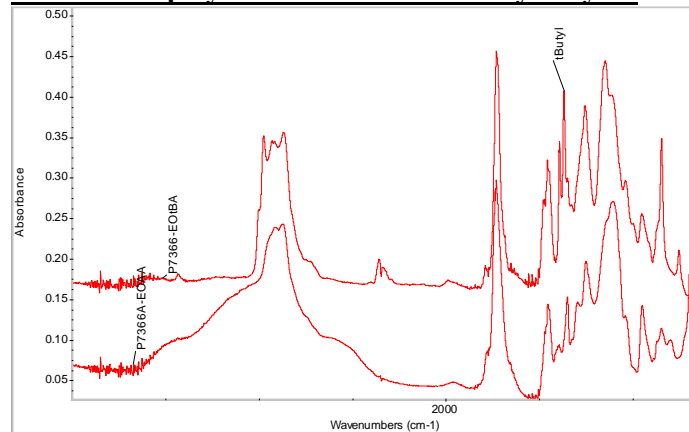
— Poly(ethylene oxide),  $M_n=5,000$ ,  $M_w=5,500$ ,  $\text{PI}=1.05$

— Block Copolymer PEO(5,000)-b-tBA(6,000),  $\text{PI}=1.10$

Composition from  $^1\text{H NMR}$

After Hydrolysis: PEO(5,000)-b-AA(3,200)  $M_w/M_n$  1.10

**FTIR of the polymers before and after hydrolysis:**



### Thermal analysis of the P16279A- EOAA

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 ( $T_g$ ).

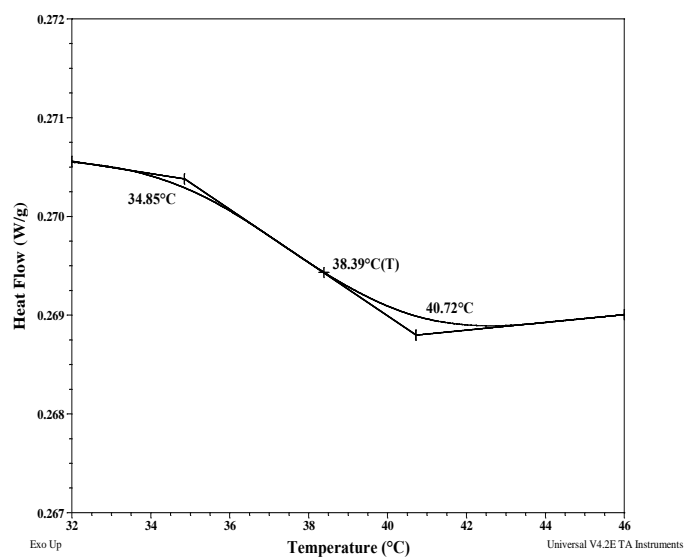
### Melting and crystallization curve for the sample

The melting temperature ( $T_m$ ) was taken as the maximum of the endothermic peak whereas the crystallization temperature ( $T_c$ ) was considered as the minimum of the exothermic peak.

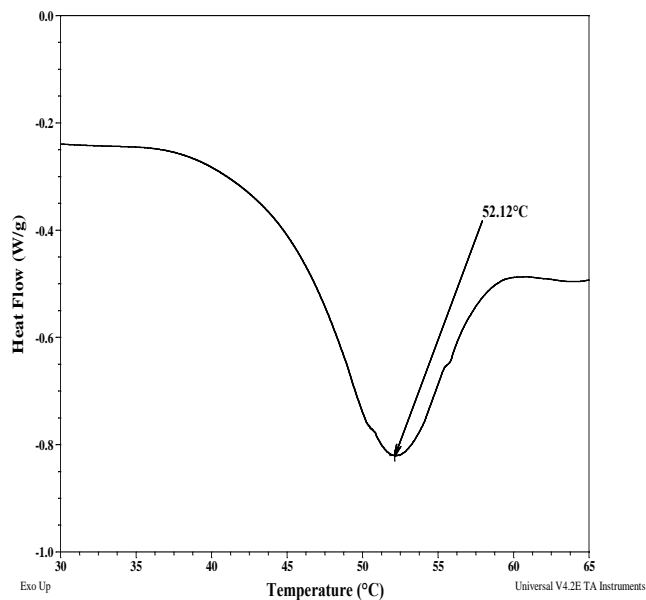
### Typical thermal analysis results at a glance:

Sample	$T_m$ (°C)	$T_c$ (°C)	$T_g$ (°C)
EO	52	-	-28
AA			38

### Thermogram for AA block:



### Melting curve for EO block:



### Thermogram for the EO block

