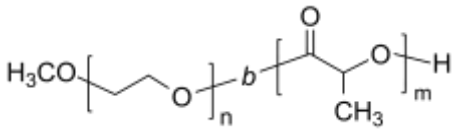
Sample Name: **Poly(ethylene oxide)–*b*–poly(D,L-lactide)**

Sample #: **P40619-EOLA (DL form)**

Structure:



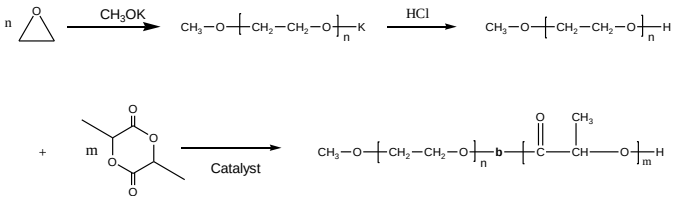
Composition:

$M_n \times 10^3$ (g/mol) [PEO–*b*–PLA]	M_w/M_n
11.0–*b*–0.6	1.08

Glass transition temperature, T_g (PEO block):	–37 °C
Melting point, T_m (PEO block)*:	57 °C
Crystallization point, T_{cr} (PEO block):	29 °C
**T_g of PLA block overlaps with T_m of PEO block.*	

Synthesis procedure:

Scheme of poly(ethylene oxide–*b*–lactide) synthesis is shown below:



Characterization:

To determine the molecular weight of the first block, an aliquot of anionic poly(ethylene oxide) block was terminated before addition the lactide monomer, and analyzed by size exclusion chromatography (SEC) using DMF as an eluent. The final block copolymer composition was calculated from ^{1}H-NMR spectroscopy by comparing the peak area of the methoxy-protons of poly(ethylene oxide) at *ca*. 3.6 ppm and the poly(lactide) protons at *ca*. 5.1 and 1.55 ppm. The polydispersity index (M_w/M_n) of the diblock copolymer was obtained by SEC.

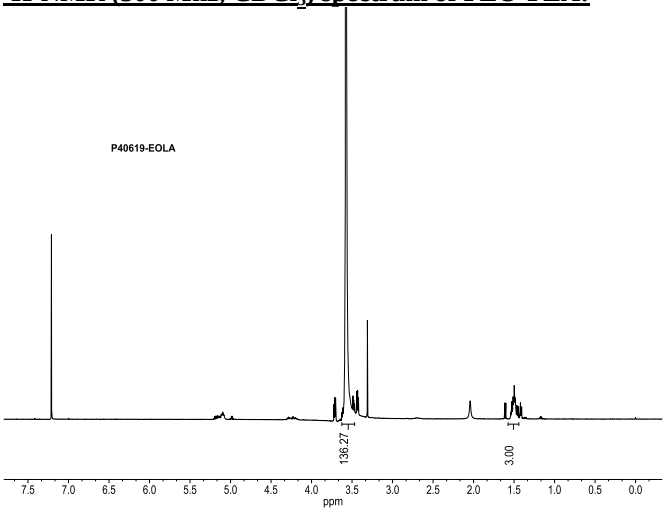
Thermal analysis:

Thermal analysis was performed on TA Instruments Q100 differential scanning calorimeter (DSC) under a nitrogen atmosphere. The glass transition temperature (T_g) and melting point (T_m) of the polymer were measured at a scan rate of 10°C/min shortly after creating thermal history of the sample.

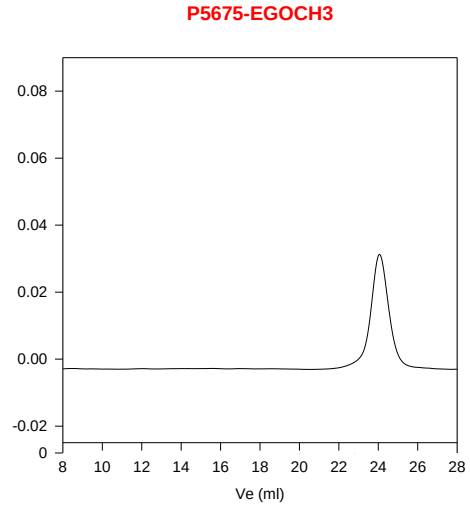
Solubility:

The polymer is soluble in chloroform, THF, DMF, toluene; and it precipitates from ethanol, ether, and hexanes.

^{1}H-NMR (500 Mhz, $CDCl_3$) spectrum of PEO-PLA:

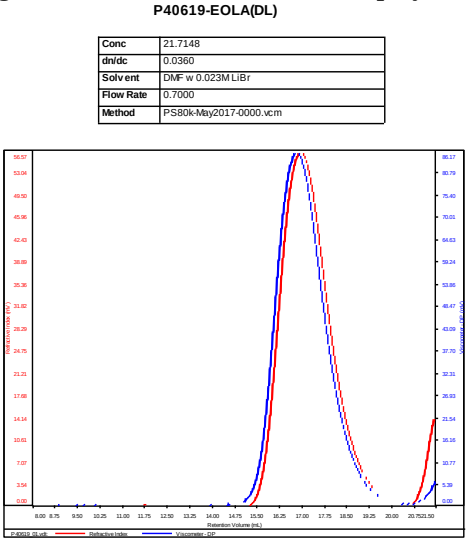


SEC elugram of the PEO (first block):



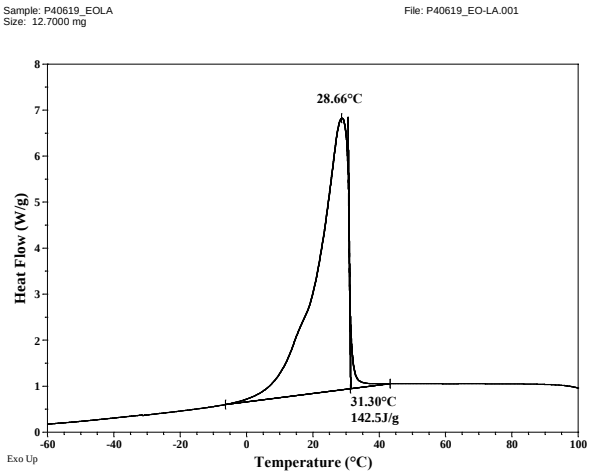
Size exclusion chromatograph of Poly(ethylene glycol) methyl ether: M_n=11000, M_w=12000, PI=1.09

SEC elugram of the PEO-PLA diblock copolymer:

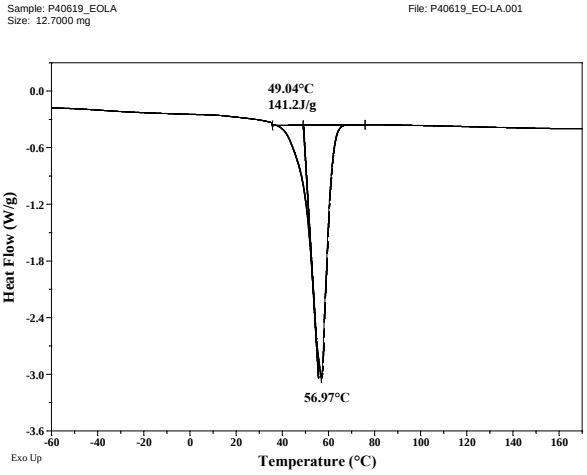


Sample	Mn	Mw	Mp	Mw/Mn	IV
P40619_01.vdt	11,898	12,832	12,434	1.078	0.0842

DSC thermograms of the polymer (2nd cooling scan, 10°C/min):



DSC thermograms of the polymer (2nd heating scan, 10°C/min):



DSC thermograms of the polymer (3rd heating scan, 10°C/min):