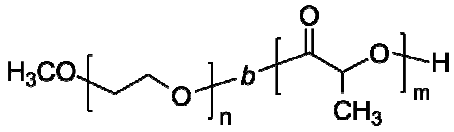
Sample Name: **Poly(ethylene oxide)–*b*–poly(D,L-lactide)**

Sample #: **P40614-EOLA (DL form)**



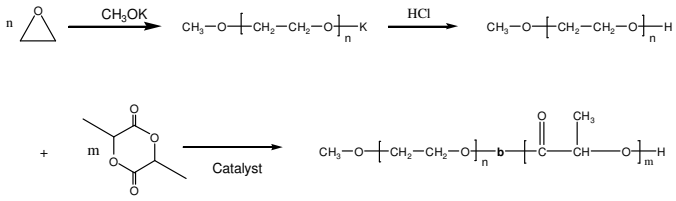
Composition:

$M_n \times 10^3$ (g/mol) [PEO–*b*–PLA]	M_w/M_n
11.0–*b*–11.0	1.4

Glass transition temperature, T_g (PEO block):	–18 °C
Cold crystallization temperature, $T_{c,cr}$:	32 °C
Melting point, T_m (PEO block)*:	56 °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.

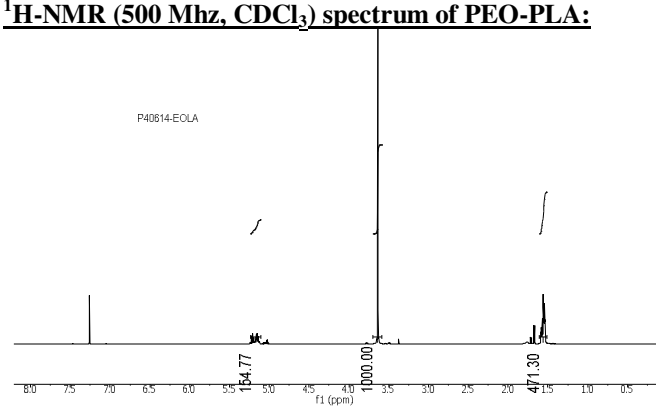
Thermal analysis:

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:

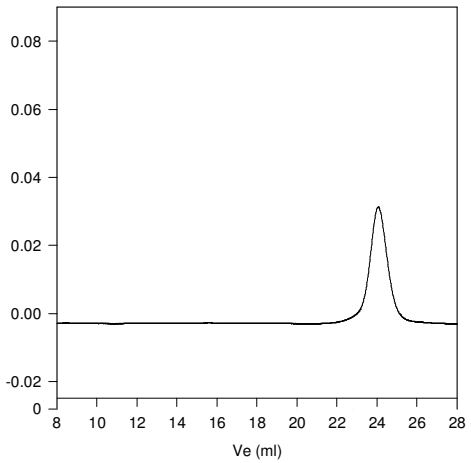
The polymer is soluble in chloroform, THF, DMF, toluene; and it precipitates from ethanol, ether, and hexanes.

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



SEC elugram of the PEO (first block):

P5675-EGOCH3

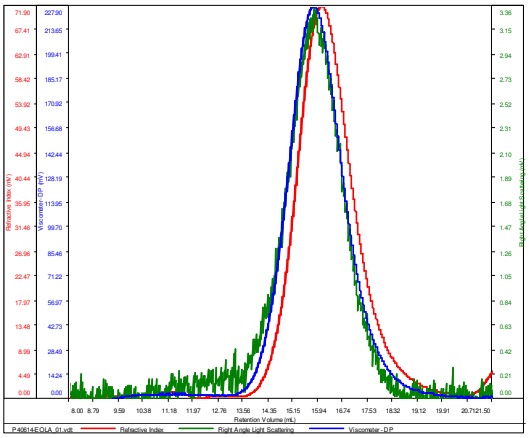


Size exclusion chromatograph of Poly(ethylene glycol) methyl ether: M_n=11000, M_w=12000, PI=1.09

SEC elugram of the PEO-PLA diblock copolymer:

P40614-EOLA(DL)

Conc	32.0279
dn/dc	0.0350
Solvent	DMF w 0.023M LiBr
Flow Rate	0.7000
Method	PS80k-May2017-0000.vcm



Sample	Mn	Mw	Mp	Mw/Mn	IV
P40614-EOLA_01.vdt	21,855	31,145	24,008	1.425	0.1700

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

[*Note*: no crystallization peak is observed for cooling scans.]