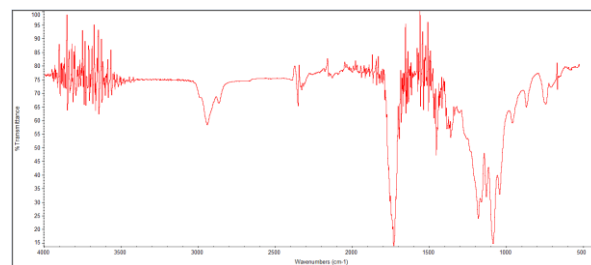
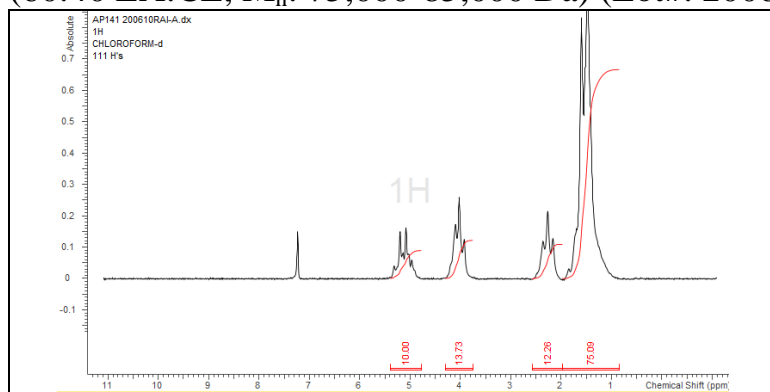


# No. AP141

# Certificate of Analysis

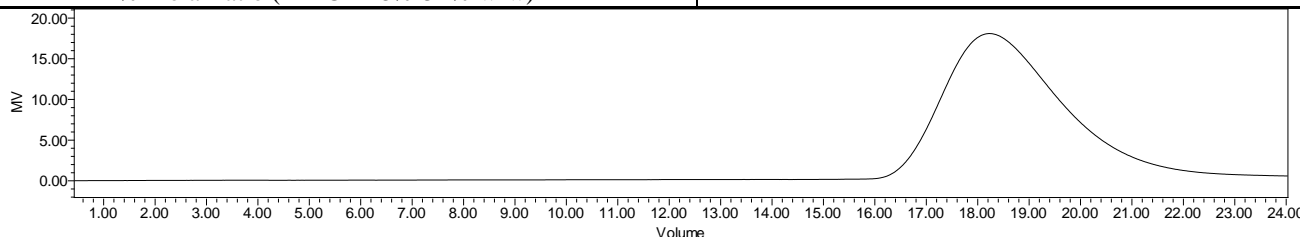


Product Name: Poly(L-Lactic-co-caprolactone) copolymers acid endcap  
(60:40 LA:CL,  $M_n$ : 75,000-85,000 Da) (Lot#: 200610RAI-A)



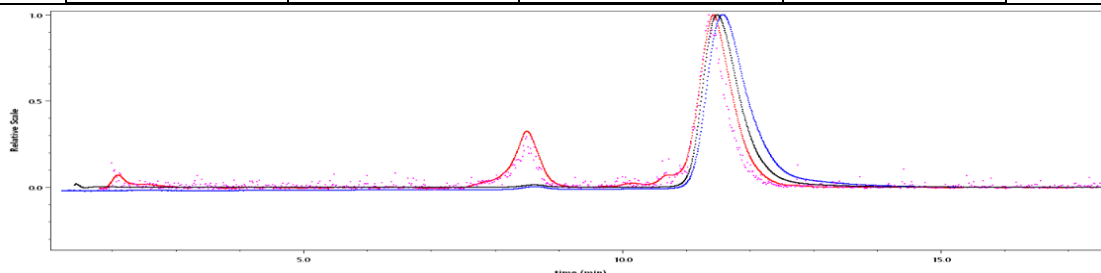
FTIR Analysis: Collected from cast-film on KBr salt-plate placed in a Nicolet Avatar 380 spectrometer with ATR Smart Orbit and analyzed in transmission mode.

H-NMR Spectrum of copolymers in CDCl<sub>3</sub> (NMReady-60e, Nanalysis 60 MHz) NMR of P(L)LCL copolymer: LA-CL = 59%-41% molar ratio (LA-CL 48%-52% w-w)



GPC Analysis Method: Waters Breeze 2 system with 1 ml/min THF flow across three GPC columns. Detection via refractive index, calibrated against polystyrene standards.

Polymer	$M_n$ (from GPC)	$M_w$ (from GPC)	PDI
P(L)LCL	75,975	91,796	1.21



GPC-4D Analysis Method: Agilent 1260 Infinity II system 0.6 ml/min Acetone flow across TSKgel GMHHR-L, 7.8 mm x 30 cm. Detection Dawn Heleos II (MALLS), Optilab T-rex (RI), Dynapro nanostar (DLS), and Viscostar III (viscosity), universal calibration (Wyatt).

Polymer	$M_n$ (from GPC-4D)	$M_w$ (from GPC-4D)	$M_p$ (from GPC-4D)	Radius rh(v)(avg), (nm)	Intrinsic viscosity ([ $\eta$ ](avg), mL/g)	Refractive index (dn/dc, Acetone, online determination)
P(L)LCL	72,098	120,721	105,717	6.4	45.548	0.1012

\* - Due to differences in methodology, Results from GPC-4D universal calibration will be different from those obtained from GPC-ES. The data from GPC-4D analysis is provided for customer information only.

## Structure of P(L)LCL copolymers

