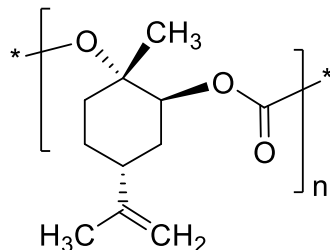


**Sample name: Poly(limonene carbonate):**  
*Alternating copolymer of limonene oxide and carbon dioxide (regioregular form)*

**Sample #: P41333A-LimC**

**Structure:**



**Composition:**

$M_n \times 10^3$ (g/mol)	$M_w/M_n$
1.5	1.25

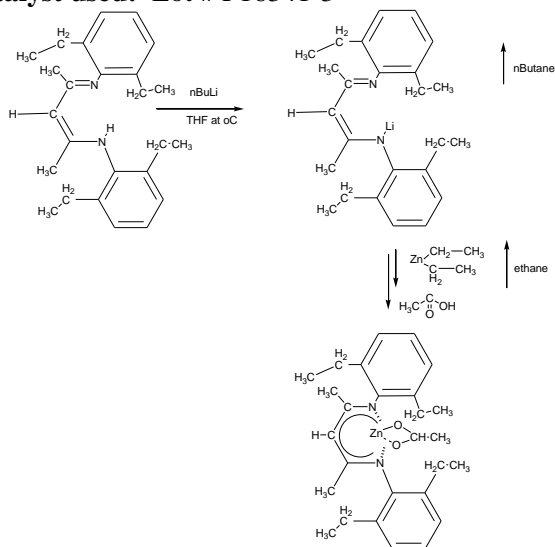
**Thermal properties:**

Glass transition temperature	85 °C
Onset of decomposition (5% wt loss):	203 °C

**Synthesis:**

The polymer was synthesized in a pressure reactor in presence of CO<sub>2</sub> and catalyst.

**Catalyst used: Lot # P16341-3**

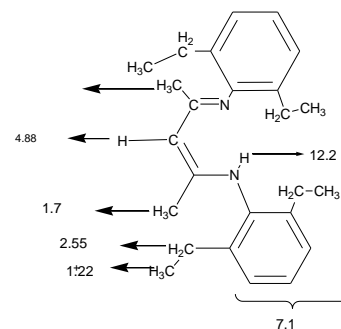
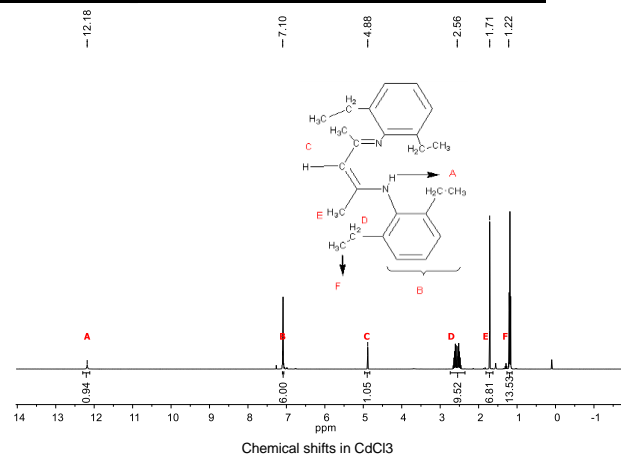


**Characterization:**

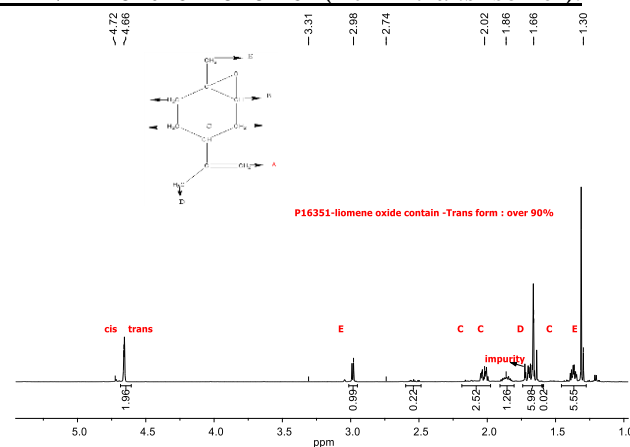
The product was characterized by size exclusion chromatography (SEC) and proton NMR.

**Thermal analysis** was performed on TA Instruments TGA-550 Discovery (TGA) and Q100 differential scanning calorimeter (DSC). **TGA:** The degradation temperature was measured at a scan rate of 5°C/min under a nitrogen atmosphere. **DSC:** The glass transition temperature (T<sub>g</sub>) of the polymer was measured at a scan rate of 10°C/min shortly after creating thermal history of the sample.

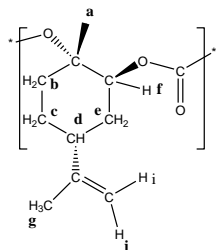
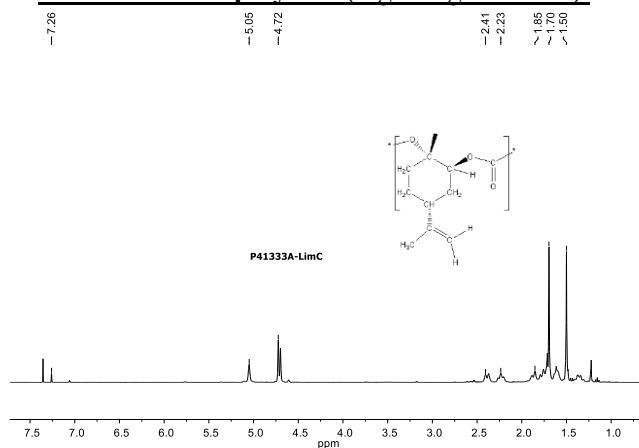
**<sup>1</sup>H NMR spectrum of the catalyst (BDEt)-H**



**<sup>1</sup>H NMR of the monomer (rich in *trans* isomer):**

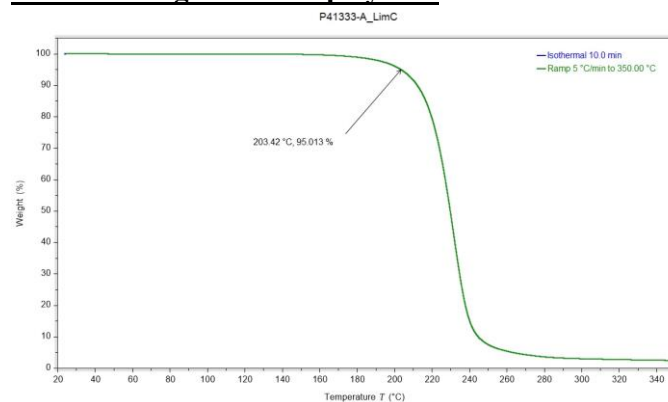


## <sup>1</sup>H NMR of the polymer (regio-regular form):

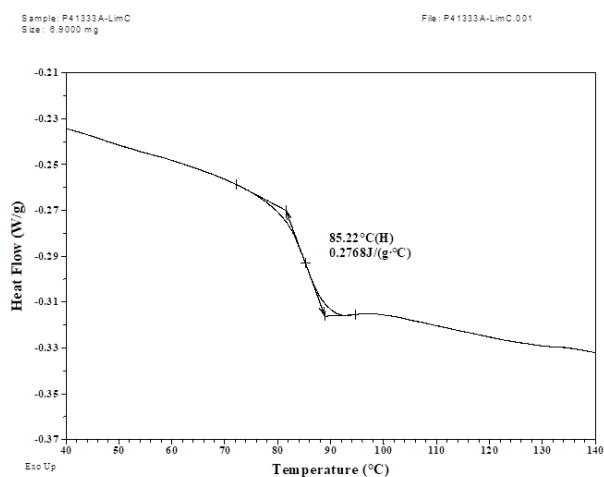


Proton group	Peak assignment	Chemical shift
CH <sub>3</sub>	a	1.7ppm
CH <sub>2</sub>	b	2.4 ppm
CH <sub>2</sub>	c	1.58 and 1.36 ppm
H	d	2.2ppm
CH <sub>2</sub>	e	1.87 and 1.6 ppm
H	f	5.04 ppm
CH <sub>3</sub>	g	1.5 ppm
=CH <sub>2</sub>	h	4.71 and 4.69

## TGA thermogram of the polymer:



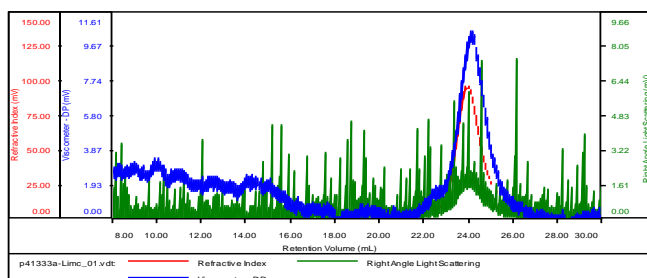
## DSC thermogram (2<sup>nd</sup> heating scan):



## SEC chromatogram:

**P41333A-LimC**

Concentration (mg/mL)	0.4808
Sample dn/dc (mL/g)	0.1850
Method File	PS80K-June272017-0000.vcm
Column Set	3x PL 1113-6300
Solvent	THF



Sample	Mn (Da)	Mw (Da)	Mw/Mn	IV (dL/g)	Mp (Da)
p41333a-Limc_01.v	1,535	1,922	1.252	1.0183	1,084