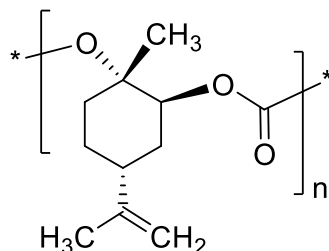


Sample name: Poly(limonene carbonate):

Alternating copolymer of limonene oxide and carbon dioxide (*regioregular form*)

Sample # P41298-LimC

Structure:



Composition:

$M_n \times 10^3$ (g/mol)	M_w/M_n
8.5	1.09

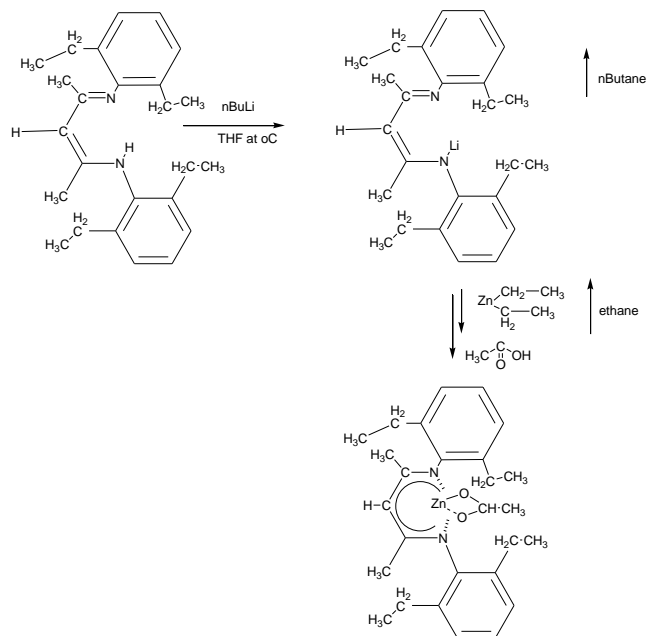
Thermal properties:

Glass transition temperature	$T_g = 102^\circ\text{C}$
Onset of decomposition (5% wt loss):	$T_{on} = 211^\circ\text{C}$

Synthesis:

The polymer was synthesized in a pressure reactor in presence of CO₂ and catalyst.

Catalyst used: Lot # P16341-3

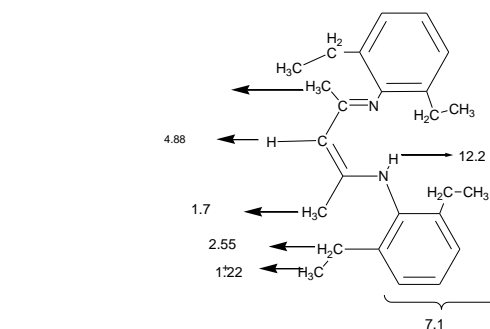
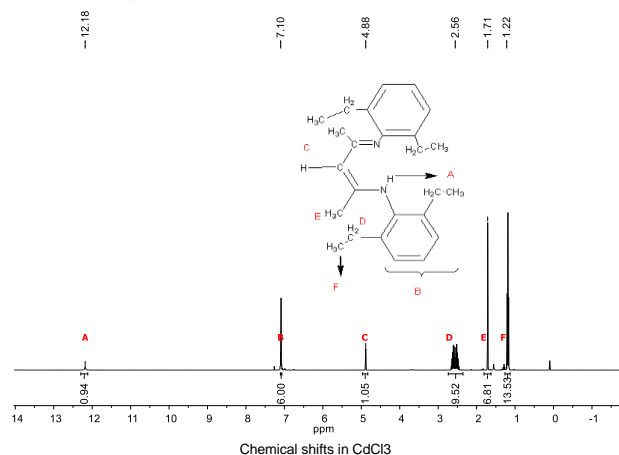


Characterization:

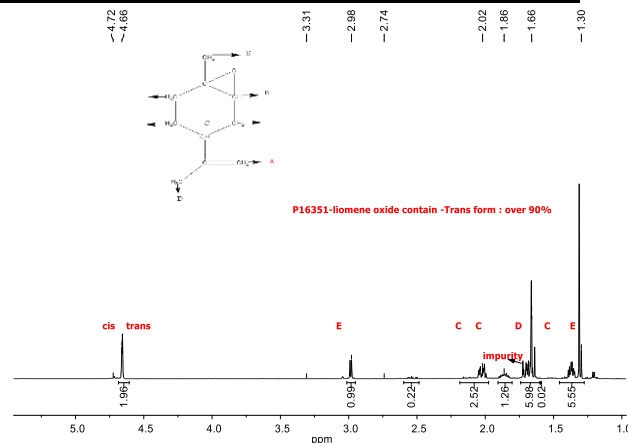
The product was characterized by size exclusion chromatography (SEC) and proton NMR.

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_g) of the polymer was measured at a scan rate of 10°C/min shortly after creating thermal history of the sample.

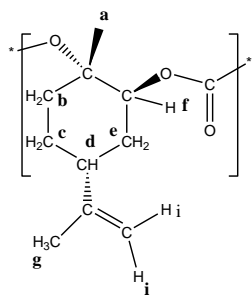
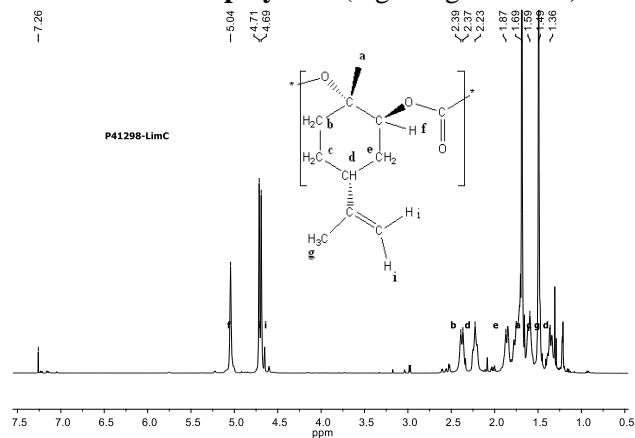
¹H NMR spectrum of the catalyst(BDEt)-H



¹H NMR of the monomer (rich in *trans* isomer):

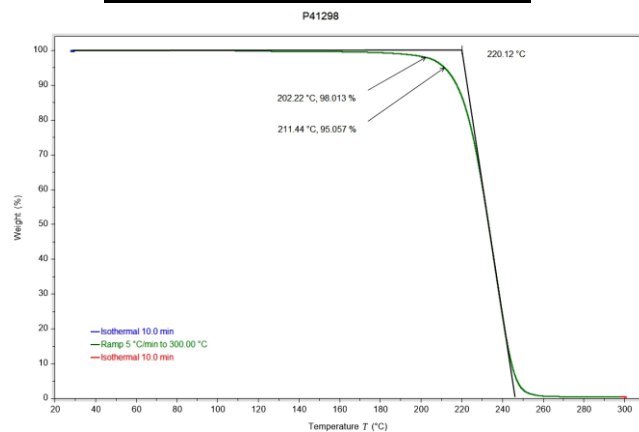


¹H NMR of the polymer (regio-regular form):



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

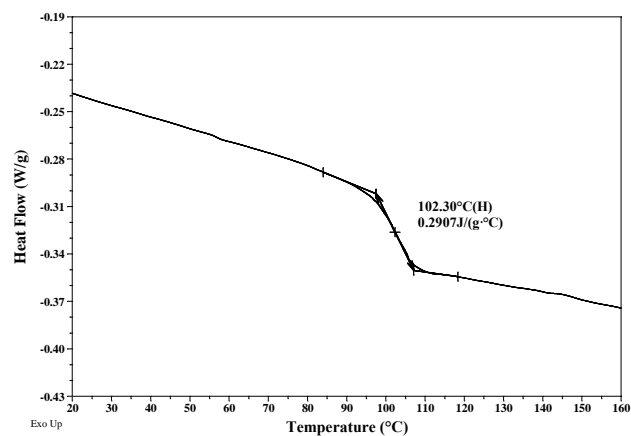
TGA thermogram of the polymer:



DSC thermogram (2nd heating scan):

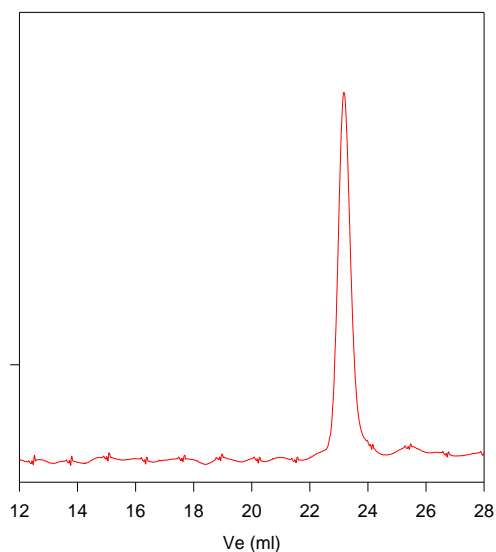
Sample: 41298-LimC
Size: 9.7000 mg

File: P41298_LimC (dry).001



SEC chromatogram:

P41298-LimC



Size exclusion chromatograph of PLimC:
M_n=8,500, M_w=9,300, PDI=1.09