Electronic Supplementary Material (ESI) for Soft Matter.

Supporting Information

Understanding the effect of liquid crystal content on the phase behavior and mechanical properties of liquid crystal elastomers

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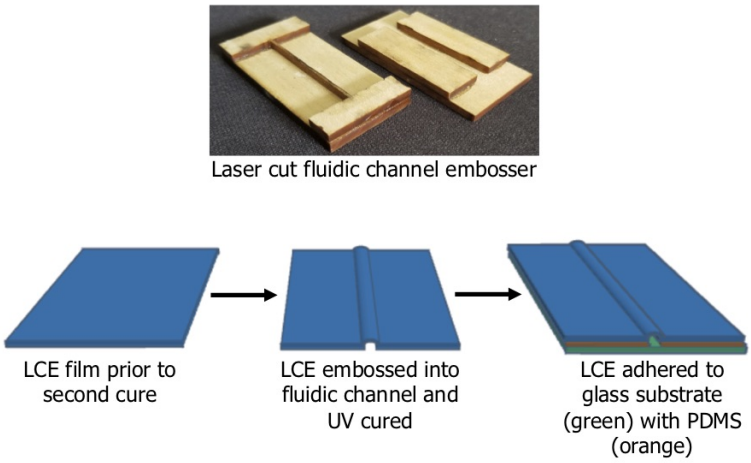

Figure S1 TOP Photograph of laser-cut and assemble fluidic channel embosser. **Bottom** Schematic of LCE fluidic channel synthesis. First, a flat LCE film is synthesized which is embossed into a fluidic channel and UV cured to program the shape change. The LCE is then adhered to glass using PDMS. The channel collapses and raises when heated and cooled, respectively.

	RM257 mg [mmol]	EDDET mg [mmol]	PETMP mg [mmol]	TEGDA mg [mmol]	HHMP mg	DPA 2 wt% in CHCl3 mg	$CHCl_3$ mg	mass % RM257
0 mol% acrylate from TEGDA	588 [1]	124.09 [0.68]	55.45 [0.1126]	0 [0]	2.94	181.34	235.2	76.6%
5 mol% acrylate from TEGDA	588 [1]	130.62 [0.71]	58.37 [0.1196]	15.91 [0.05]	3.02	190.88	235.2	74.15%
10 mol% acrylate from TEGDA	588 [1]	137.87 [0.75]	61.62 [0.1262]	33.58 [0.1]	3.11	201.49	235.2	71.61%
15 mol% acrylate from TEGDA	588 [1]	145.99 [0.80]	65.24 [0.1337]	53.35 [0.15]	3.26	213.34	235.2	68.69%
20 mol% acrylate from TEGDA	588 [1]	155.11 [0.85]	69.32 [0.1420]	75.58 [0.20]	3.32	226.68	235.2	66.21%

Table S1 Table of reagent amounts used to synthesize TEGDA LCEs.

	RM257 mg [mmol]	EDDET mg [mmol]	PETMP mg [mmol]	LiTFSI mg [mmol]	HHMP mg	TEA	$CHCl_3$ mg	mass % RM257
0 mol% Li+/EO	588 [1]	124.09 [0.68]	55.45 [0.1126]	0	2.94	3.62	705.6	76.6%
5 mol% Li+/EO	588 [1]	124.09 [0.68]	55.45 [0.1126]	19.52 [0.068]	2.94	3.62	705.6	74.70%
7.5 mol% Li+/EO	588 [1]	124.09 [0.68]	55.45 [0.1126]	29.28 [0.102]	2.94	3.62	705.6	73.79%
10 mol% Li+/EO	588 [1]	124.09 [0.68]	55.45 [0.1126]	39.04 [0.136]	2.94	3.62	705.6	72.90%
12.5 mol% Li+/EO	588 [1]	124.09 [0.68]	55.45 [0.1126]	48.80 [0.170]	2.94	3.62	705.6	72.02%
17.5 mol% Li+/EO	588 [1]	124.09 [0.68]	55.45 [0.1126]	68.32 [0.238]	2.94	3.62	705.6	70.35%
22.5 mol% Li+/EO	588 [1]	124.09 [0.68]	55.45 [0.1126]	87.85 [0.306]	2.94	3.62	705.6	68.74%
27.5 mol% Li+/EO	588 [1]	124.09 [0.68]	55.45 [0.1126]	107.37 [0.374]	2.94	3.62	705.6	67.20%

Table S2 Table of reagent amounts used to synthesize lithiated LCEs

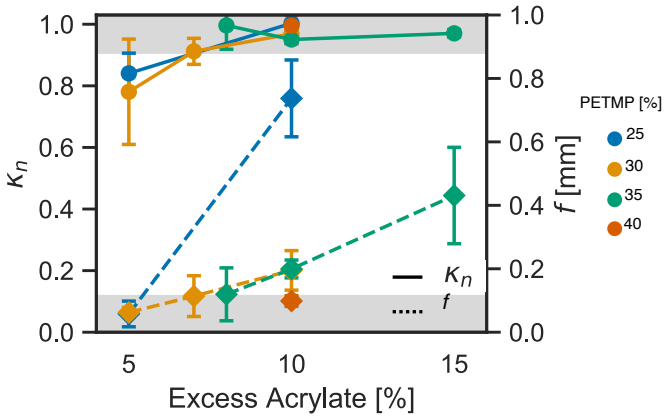

Figure S2 Optimization of the normalized curvature and flatness of an LCE with 10 mol % TEGDA.

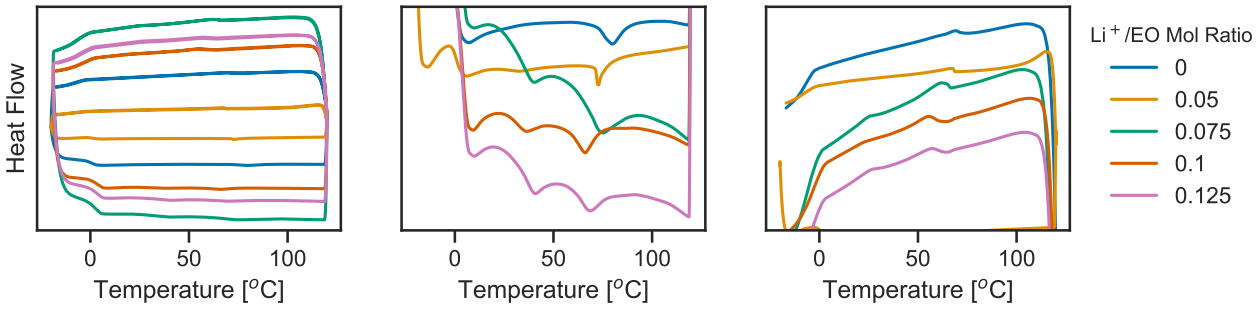

Figure S3 DSC curves of LCEs with increasing amounts of lithiation. The middle plot curve is a zoomed in region of the heating trace, and left plot is a zoomed in region of the cooling trace.