

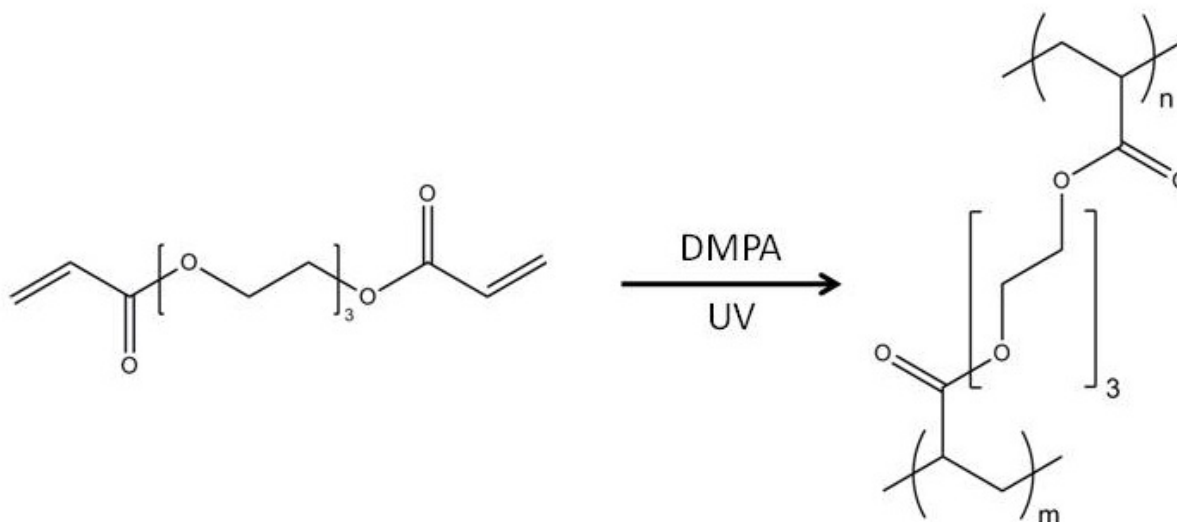
# Single-Monomer Formulation of Polymerized Polyethylene Glycol Diacrylate as a Nonadsorptive Material for Microfluidics

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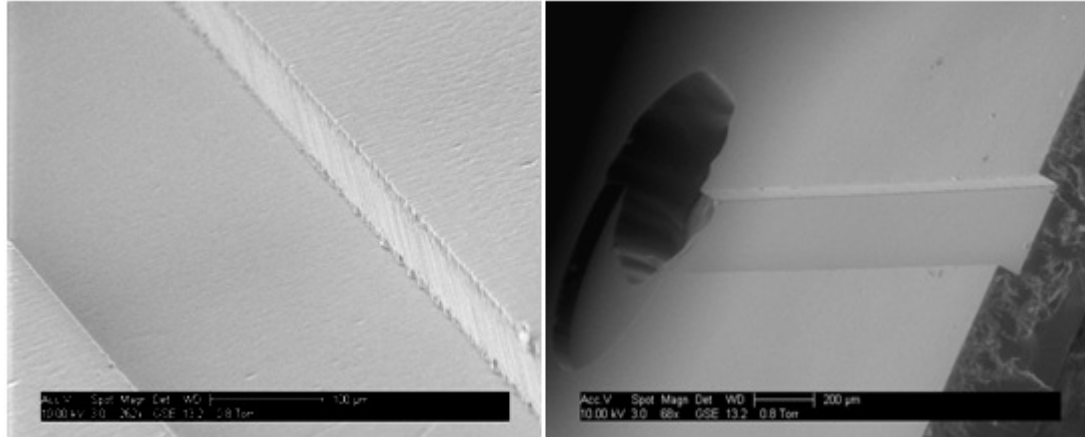
## Supporting Information

An overview of the polymerization reaction for PEGDA is given in Figure A. Scanning electron microscopy (SEM) characterization of rectangular channel features and a reservoir in poly-PEGDA is shown in Figure B. Optical transmission of poly-PEGDA is comparable to PDMS over the UV/visible spectral range (Figure C). Poly-PEGDA shows mechanical flexibility when compressed by pinching (Figure D). Formulation optimization parameters and results are shown in Tables S1-S3.

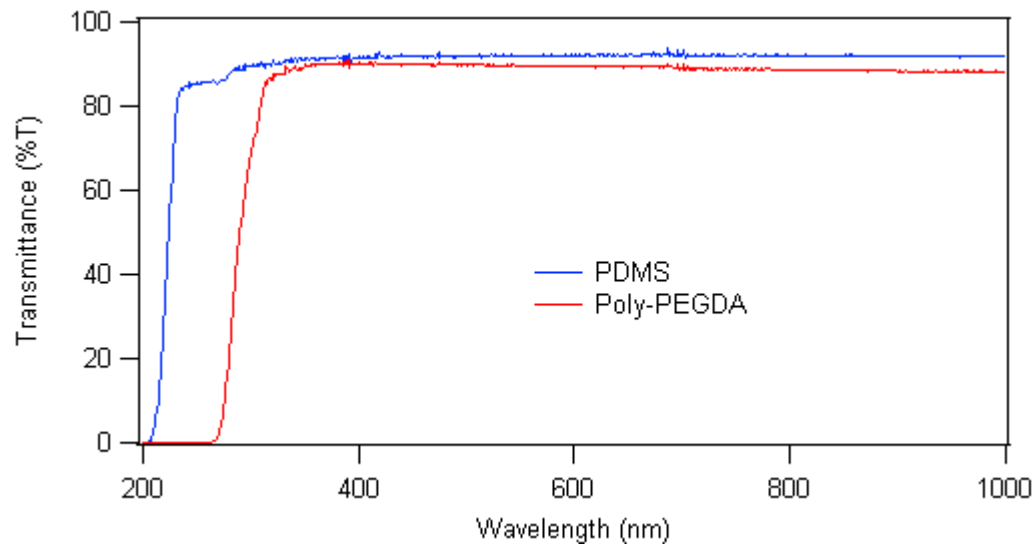


**Figure A: Polymerization of PEGDA to form poly-PEGDA.**

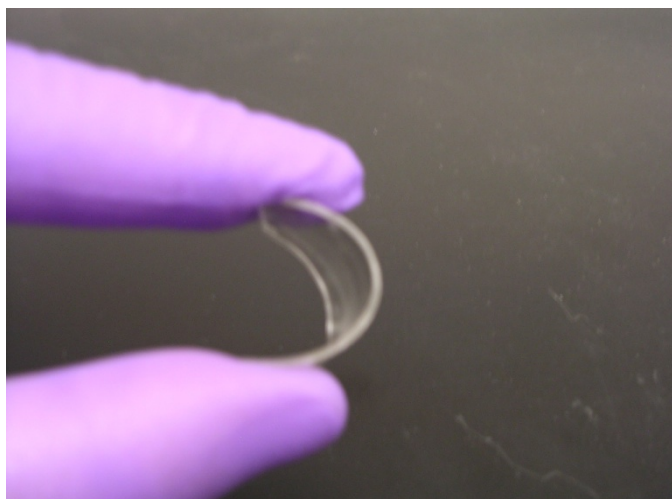
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**Figure B: SEM images of poly-PEGDA channels.** (left) Channel surface features in poly-PEGDA created using patterned SU8-2025 as a mold. (right) A straight channel feature intersecting with a fluidic input hole (created using a laser cutter). Channel dimensions are 300 μm wide and 70 μm tall.



**Figure C: Transmission spectra of 200-μm-thick layers of PDMS and poly-PEGDA.**



**Figure D: Poly-PEGDA mechanical flexibility.** Flexibility of poly-PEGDA is demonstrated as pressure is applied by pinching a 350  $\mu\text{m}$  thick piece.

**Table S1: Compositions Tested in Poly-PEGDA Optimization.**

<b>Sample ID</b>	<b>% DMPA</b>	<b>% PEGMEMA</b>	<b>% PEGDA 258</b>	<b>% MMA</b>	<b>Ratio PEGDA/ PEGMEMA</b>
<b>A</b>	0.05	16.3	81.6	2.0	<b>5.0</b>
<b>B</b>	0.30	16.1	81.5	2.1	<b>5.1</b>
<b>C</b>	0.05	15.8	79.1	5.0	<b>5.0</b>
<b>D</b>	0.30	15.8	78.8	5.0	<b>5.0</b>
<b>E</b>	0.05	8.9	88.9	2.2	<b>10.0</b>
<b>F</b>	0.31	8.9	88.7	2.1	<b>10.0</b>
<b>G</b>	0.05	8.7	86.2	5.1	<b>9.9</b>
<b>H</b>	0.31	8.6	86.1	5.0	<b>10.0</b>
<b>Sample ID</b>	<b>% DMPA</b>	<b>% PEGMEMA</b>	<b>% PEGDA 575</b>	<b>% MMA</b>	<b>Ratio PEGDA/ PEGMEMA</b>
<b>I</b>	0.06	16.2	81.2	2.5	<b>5.0</b>
<b>J</b>	0.32	16.3	81.3	2.1	<b>5.0</b>
<b>K</b>	0.05	15.8	79.1	5.0	<b>5.0</b>
<b>L</b>	0.31	15.6	78.9	5.2	<b>5.1</b>
<b>M</b>	0.05	8.9	89.0	2.0	<b>10.0</b>
<b>N</b>	0.30	8.9	88.8	2.0	<b>10.0</b>
<b>O</b>	0.05	8.6	86.3	5.0	<b>10.0</b>
<b>P</b>	0.31	8.6	86.0	5.1	<b>10.0</b>
<b>Sample ID</b>	<b>% DMPA</b>	<b>% PEGMEMA</b>	<b>% PEGDA 258</b>	<b>% MMA</b>	<b>Ratio PEGDA/ PEGMEMA</b>
<b>Q</b>	0.10	-	99.9	-	-

**Table S2: Results for Poly-PEGDA Optimization with 10 s Exposure Time.** The

polymerization scale was 0-5, where 0 = all liquid; 1 = some polymerization with about 50/50 liquid/solid; 2 = polymer formed but was soft and could be cut by tweezers using only gravity; 3 = polymer formed and was stiffer than 2, but tweezers cut into it with light pressure; 4 = polymer was stiffer than 3, and more pressure was needed to cut; and 5 = well polymerized, such that tweezers did not cut the material even with significant applied pressure. The clarity scale was 0-2, where 0 = clear, 1 = cloudy, and 2 = white.

<b>Sample ID</b>	<b>Polymerization</b>	<b>Clarity</b>	<b>Water Immersion Test</b>	<b>Comments</b>
<b>A</b>	1	0	<0.5 min	became white
<b>B</b>	5	1	>10 min	survived
<b>C</b>	1	0	<0.5 min	became white
<b>D</b>	5	0	>10 min	survived
<b>E</b>	0	0	<0.5 min	became white
<b>F</b>	5	1	>10 min	survived
<b>G</b>	0	0	<0.5 min	became white
<b>H</b>	5	0	<0.5 min	became white
<b>I</b>	1	0	>10 min	survived but not completely polymerized
<b>J</b>	4	0	1:10 min	buckled
<b>K</b>	1	0	4 min	buckled
<b>L</b>	3	0	<1 min	buckled
<b>M</b>	2	2	>10 min	really soft
<b>N</b>	4	1	4:30 min	buckled
<b>O</b>	2	0	4 min	buckled
<b>P</b>	4	0	1 min	buckled
<b>Q</b>	5	0	>10 min	survived

**Table S3: Results for Poly-PEGDA Optimization with 25 s Exposure Time.** The polymerization and clarity scales were the same as in Table S2.

<b>Sample ID</b>	<b>Polymerization</b>	<b>Clarity</b>	<b>Water Immersion Test</b>	<b>Comments</b>
<b>A</b>	5	1	>10 min	survived
<b>B</b>	5	2	>10 min	survived
<b>C</b>	3	0	>10 min	survived but really soft when removed from wafer
<b>D</b>	5	1	>10 min	survived
<b>E</b>	5	1	>10 min	survived
<b>F</b>	5	2	>10 min	survived
<b>G</b>	3	1	<0.5 min	turned white
<b>H</b>	5	1	>10 min	survived
<b>I</b>	3	0	1:30 min	buckled
<b>J</b>	5	0	7 min	buckled
<b>K</b>	3	0	6:30 min	buckled
<b>L</b>	4	0	2:18 min	buckled
<b>M</b>	5	1	4 min	buckled
<b>N</b>	5	0	>10 min	survived
<b>O</b>	3	0	3 min	buckled
<b>P</b>	5	0	>10 min	some separation from silicon but no buckling
<b>Q</b>	5	0	>10 min	survived