

Complete Plastic Nanofluidic Devices for DNA Analysis via Direct Imprinting with Polymer Stamp

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Supplementary Information

1. Details about funnel inlet

The funnel structure consists of 16 trapezoid prisms. All the trapezoid prisms were mill by FIB one by one. The size of each trapezoid prism was listed as below.

Table 1. Details about each trapezoid in funnel inlet

Trapezoid #	Top edge length (μm)	Bottom edge length (μm)	Height (μm)	Depth (μm)
1	20	50	6.5	10
2	12	20	6.5	6
3	6	12	6.5	4
4	4	6	6.5	3
5	1.8	4	6.5	2
6	1.2	1.5	6.5	1.2
7	0.8	1.2	3	0.8
8	0.6	0.8	3	0.6
9	0.5	0.6	3	0.5
10	0.35	0.5	3	0.35
11	0.26	0.35	3	0.26
12	0.2	0.26	3	0.2
13	0.15	0.2	2	0.15
14	0.12	0.15	2	0.12
15	0.09	0.12	2	0.09
16	0.075	0.09	2	0.075

2. Details about reproducibility during NIL

The reproducibility of polymer stamp was studied by reuse the stamp for 10 times. SEM images were taken from 1st and 10th copy of PMMA substrate. As it shows in Fig 1 and Fig 2, no significant deformation was observed on both micro and nanoscale patterns.

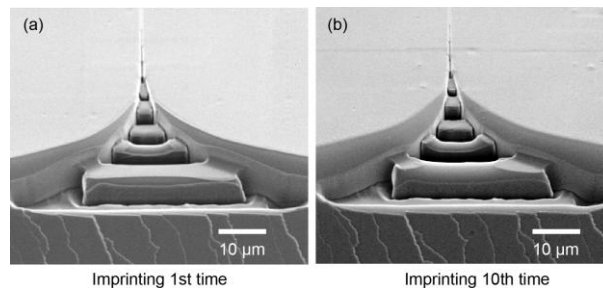


Fig 1. The SEM images of funnel inlet on PMMA substrate for the 1st and 10th replica. The images were taken with a tilt angle of 70°. No significant deformation was found after using UV-resin stamp for multiply times.

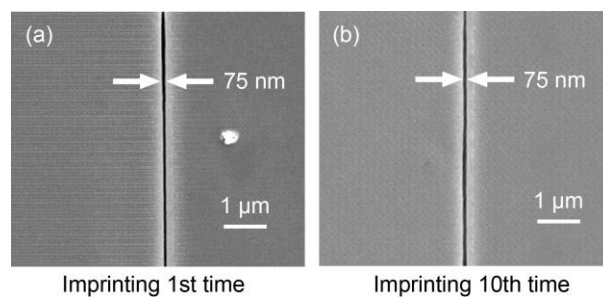


Fig 2. The SEM images of nanochannel on PMMA substrate for the 1st and 10th replica. No significant deformation of nanochannel was found after using UV-resin stamp for multiply times.