Supporting information

Template assisted highly ordered novel self assembly of micro-reservoirs and its replication

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SI 1. Effect of solvent vapor pressure on micro-cavities

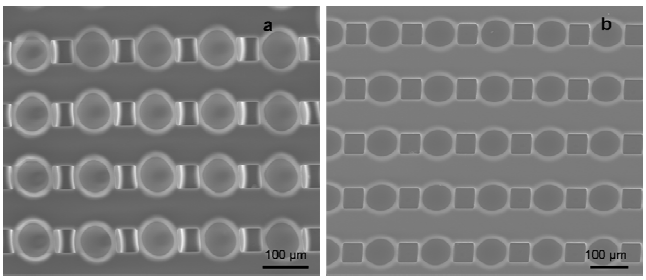

Fig. SEM images of micro-cavity pattern in polymer films fabricated by using (a) dichloromethane (b) dichloroethane as solvent. All other conditions same.

SI 2. The effect of film thickness on the nature of on micro-cavities

Experiments were carried out to explore the effect of film thickness on the nature of patterns. Polymer films of thickness ~ 150 ± 5 µm, 300 ± 20 µm and 700 ± 30 µm were achieved by controlling the speed of initial liquid spreading.

Results of figure S3 show that in the polymer film with a thickness of 150 ± 5 µm the micro-cavity mouth are of the size of 70 ± 5 µm, are evenly distributed and each balloon is attached to a square trench. In case of the polymer film with a thickness of 300 ± 20 µm the micro cavity mouth are of the size of 85 ± 5 µm, evenly distributed and one cavity located in between two square trenches attached to both the trenches. In even thicker film i.e. 700 ± 30 µm, micro-cavity mouth of size 100 ± 5µm are noted, however, these cavities are not evenly distributed in the film and each cavity is located at the centre of four square trenches. Once again these evolutions can be understood in terms of the suggested mechanism.

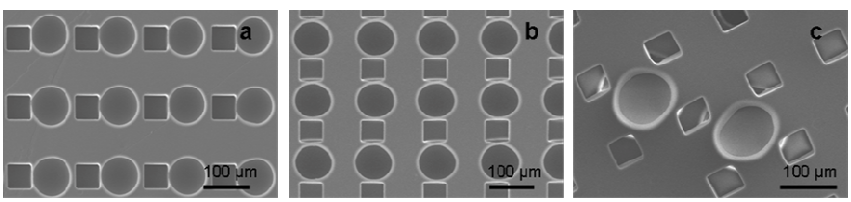

Fig. SEM images of micro-cavity pattern occurred in polymer films of the thickness of (a) 150 ± 5 µm (b) 300 ± 20 µm (c) 700 ± 30 µm

SI 3. Effect of pre-curing time

Figure show that the pre-curing waiting time also has an effect on the size and alignment of microballons. In this case, prepolymer solution was spread over the PDMS mold and kept as it is for a particular time before curing it in UV. It was observed that the size and alignment of microballons varies with varying pre-curing waiting time.

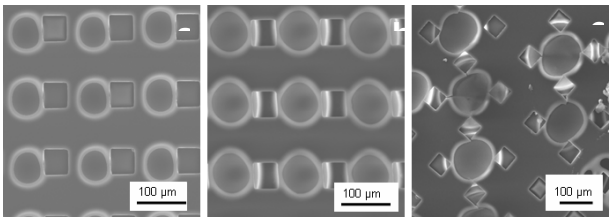

Figure SEM images of micro-cavity pattern occurred in polymer films where pre-curing time was varied from (a) 1 min, (b) 7 min, (c) 30 min

SI 4. Statistical analysis.

Exp No	Number of readings per sample						Average Size (µm)	Standard deviation (µm)
	I	II	III	IV	V	VI		
1	74.33	72.56	68.23	78	80.01	74.2	74.56	4.14
2	78.73	70.43	80.12	76.46	74.78	72.4	75.49	3.70
3	72.86	80.46	71.24	78.46	75.2	72.1	75.05	3.71
4	74.82	78.73	79.82	70.89	76.45	77.3	76.34	3.19
						Total average	75.36	3.69

Table 1. Mouth size of microcavities formed in the film when polymer solution viscosity was 24 cP.

Exp No	Number of readings per sample						Average Size (µm)	Standard deviation (µm)
	I	II	III	IV	V	VI		
1	56.45	52.38	58.29	54.63	50.51	61.09	55.56	3.88
2	54.08	59.23	57.89	53.34	58.39	50.46	55.57	3.47
3	57.89	56.45	54.96	49.69	56.68	60.21	55.98	3.55
4	59.62	62.35	51.43	54.92	58.98	53.18	56.75	4.22
						Total average	55.96	3.78

Table 2. Mouth size of microcavities formed in the film when polymer solution viscosity was 132 cP.

Exp No	Number of readings per sample						Average Size (µm)	Standard deviation (µm)
	I	II	III	IV	V	VI		
1	43.76	48.29	41.5	44.3	45.96	38.2	43.67	3.51
2	39.44	46.63	41.87	48.36	46.63	43.32	44.38	3.40
3	45.46	49.36	41.87	46.62	42.56	49.37	45.87	3.23
4	50.28	46.21	40.43	48.92	41.92	38.35	44.35	4.83
						Total average	44.57	3.74

Table 3. Mouth size of microcavities formed in the film when polymer solution viscosity was 250 cP.