

Supplementary Information

Facile fabrication of centimeter-scale stripes with inverse-opal photonic crystals structure and analysis of formation mechanism

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Table S1. The parameters to synthesize polymeric spheres.

St/[g]	MMA/[g]	AA/[g]	DI/[g]	SDBS/[g]	Ammonium bicarbonate/[g]	APS/[g]	D/[nm]	PDI
20	1	1	100	0.0380	0.5	0.48	220	2.0%
20	1	1	100	0.0314	0.5	0.48	240	3.4%
20	1	1	100	0.0285	0.5	0.48	250	2.7%
20	1	1	100	0.0219	0.5	0.48	270	3.9%
20	1	1	100	0.0201	0.5	0.48	287	4.3%
20	1	1	100	0.0174	0.5	0.48	300	4.1%
20	1	1	100	0.0127	0.5	0.48	350	4.6%
20	1	1	100	0.0103	0.5	0.48	355	4.3%
20	1	1	100	0.0	0.5	0.48	405	4.7%
20	1	1	85	0.0	0.5	0.48	448	4.7%

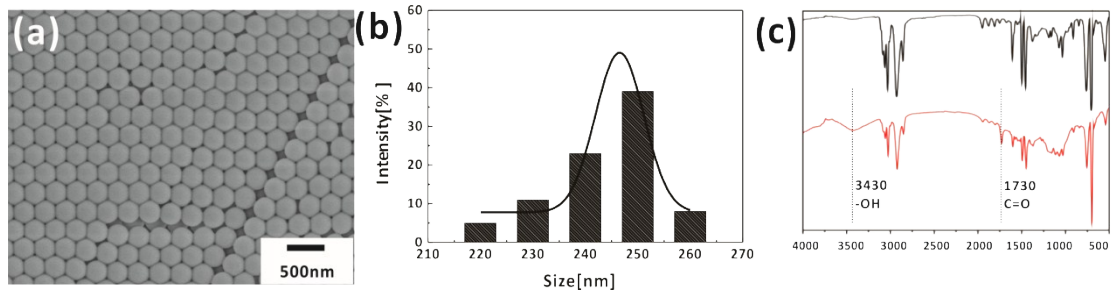


Fig. S1 (a) Typical SEM image of P(St-MMA-AA) composite colloidal sphere. (b) Size distribution, (c) FTIR spectra of pure PS and P(St-MMA-AA) composite colloidal spheres.

The zeta potential of P(St-MMA-AA) and PS are -39.0 mV and -18.9 mV respectively.

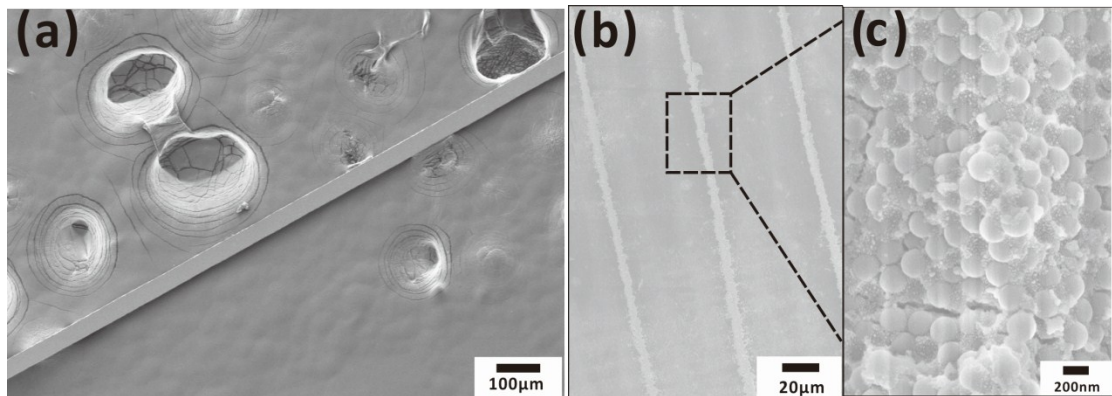


Fig. S2 SEM images of (a) a single ICPCs stripe and (b) line pattern, with (c) close-up image of the line before sintering.

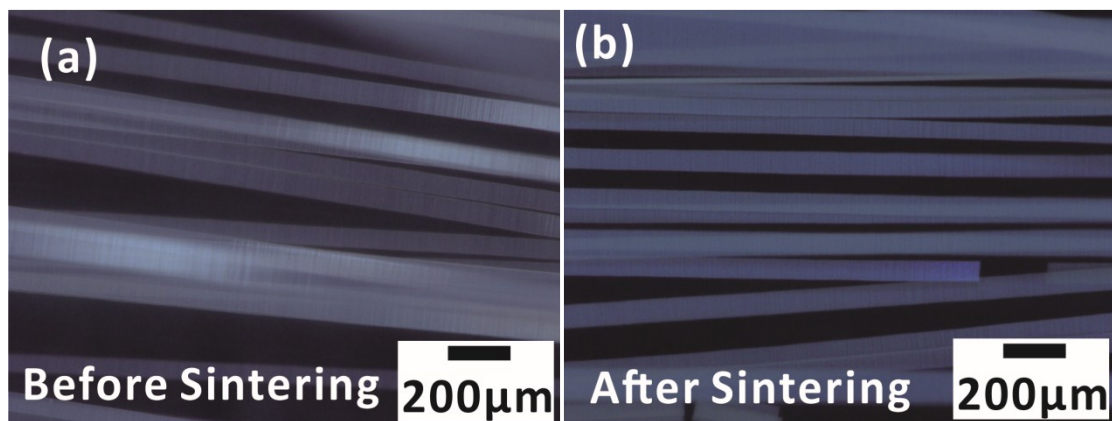


Fig. S3 Images from the same sample taken by SDFTDM and from the static growth zone.

(a) CPC stripes before sintering. (b) CPC stripes after sintering. $C_p=0.4 \times 10^{-2}$ g/ml, $D=230$ nm

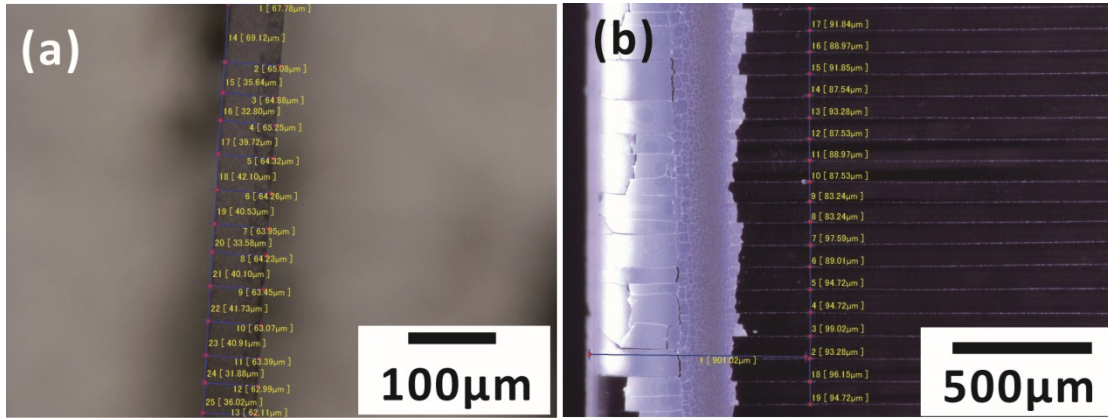


Fig. S4 (a) Width distribution along a ICPC stripe. (b) Measuring the spacing of the line pattern as the width of the stripes under the optical microscope.

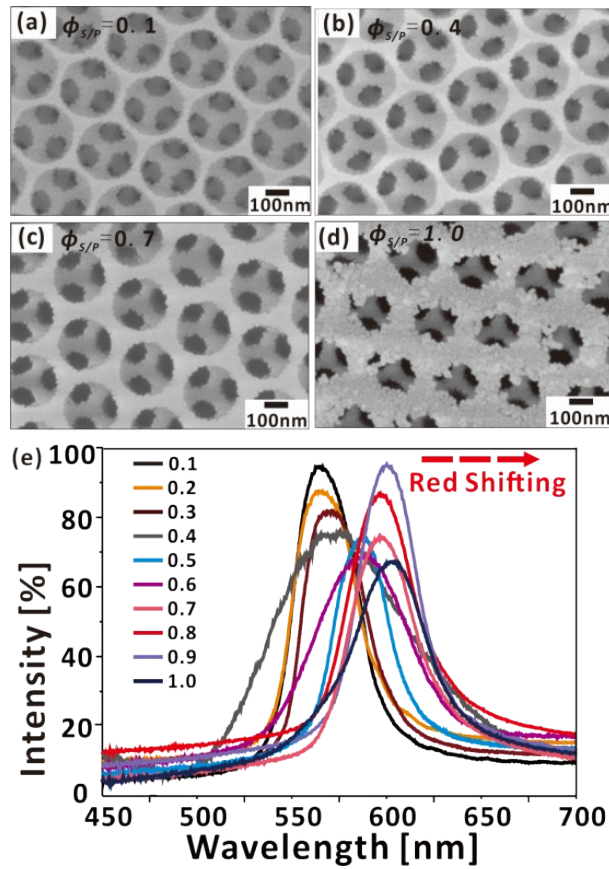


Fig. S5 SEM micrographs of ICPCs stripes fabricated with different concentration ratios of silica particles and microspheres, and reflection optical spectra. $C_p=0.4 \times 10^{-2}$ g/ml, $D=270$ nm. (a) $\phi_{s/p}=0.1$, (b) $\phi_{s/p}=0.4$, (c) $\phi_{s/p}=0.7$, (d) $\phi_{s/p}=1.0$, (e) Red shifting of reflective spectra occurs with the increasing $\phi_{s/p}$; the peak positions changes from 560 to 610 nm.

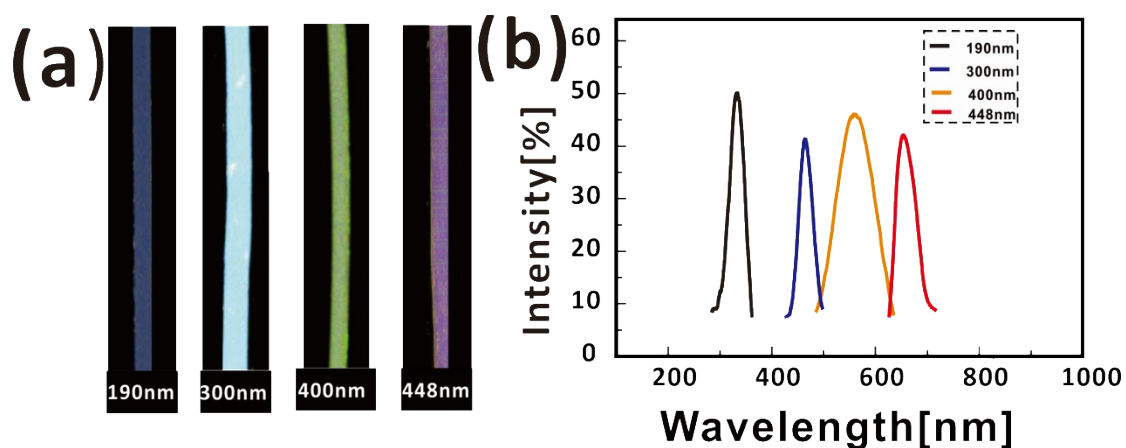


Fig. S6 (a) Optical images of ICPCs stripes fabricated using different sizes of P(St-MMA-AA). (b) Reflective spectra corresponding to the different stripes in (a). $C_p=0.4 \times 10^{-2}$ g/ml, $\phi_{S/P}=0.4$.

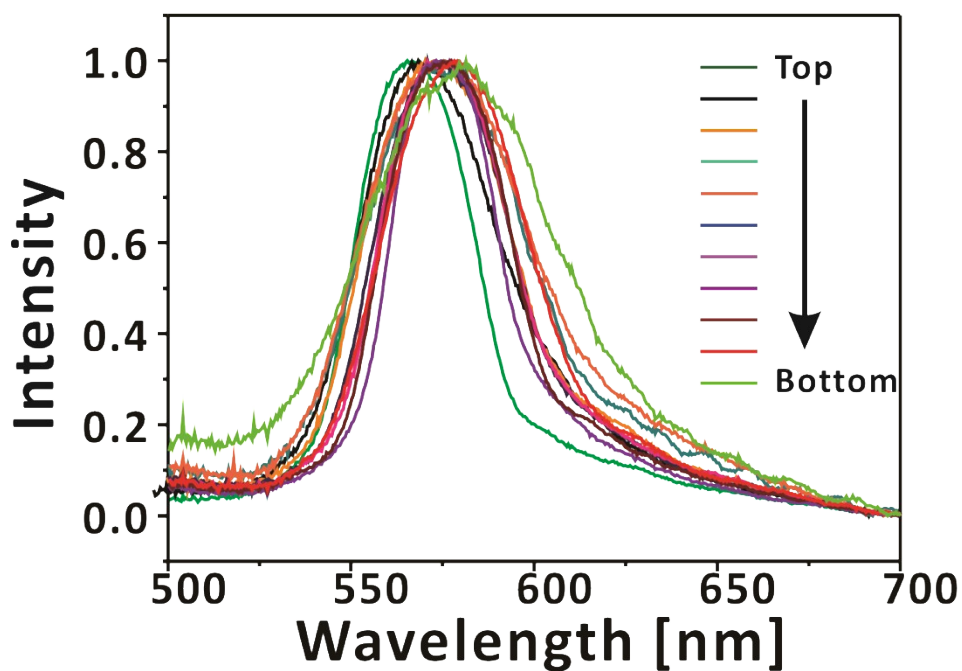


Fig. S7 Reflective spectra are collected along the length direction and the peak positions are shifting from 560 to 585 nm. $C_p=0.4 \times 10^{-2}$ g/ml, $D=270$ nm, $\phi_{S/P}=0.4$.

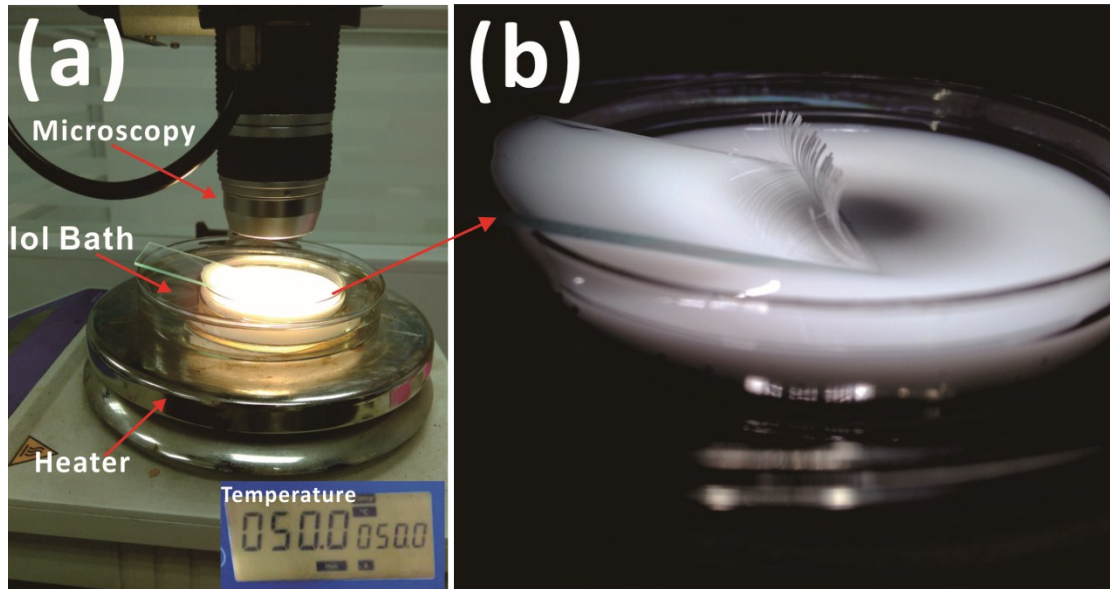


Fig. S8 In-situ observation setup (a). The peeled stripes form accompanying the growth of colloidal film (b).

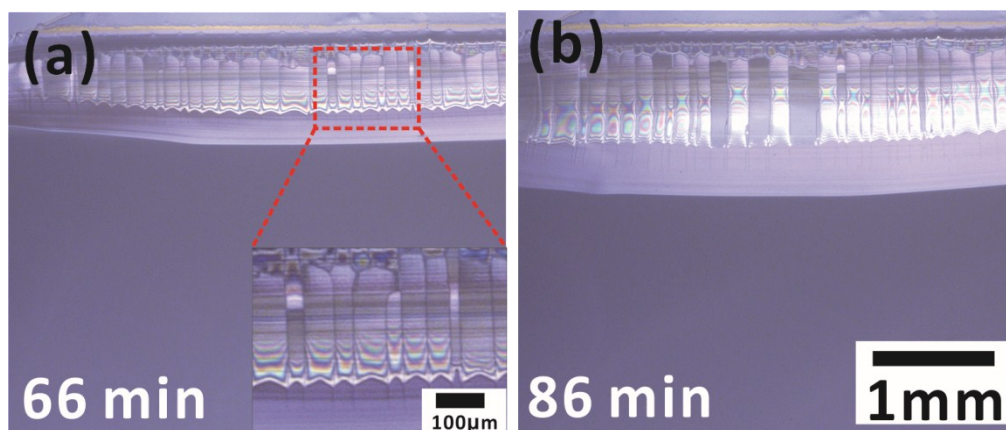


Fig. S9 (a) Stripes are peeling off from the substrate at 66 min. The inset shows a magnified image of the boundary between the stripes and the non-peeled film. (b) Stripes and film at 86 min. $C_p=1.0 \times 10^{-2}$ g/ml, $\phi_{s/p}=0.4$, $D=270$ nm.

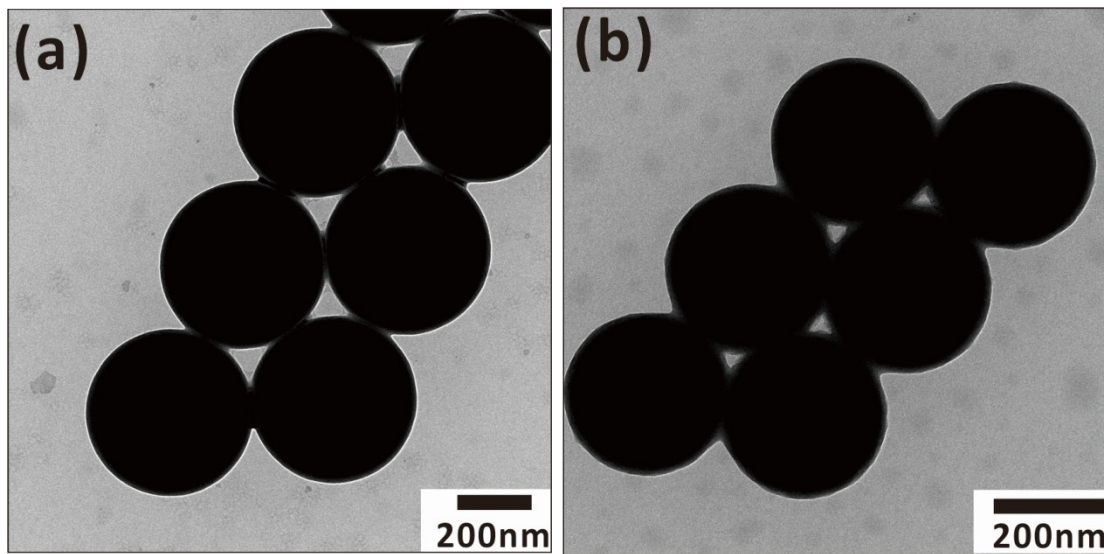


Fig. S10 TEM images of (a) PS ($D=280\text{nm}$) and (b) P(St-MMA-AA)($D=250\text{nm}$), for comparison.