Electronic Supplementary Material (ESI) for Nanoscale.

Robust Hydrophobic Veova10-Based Colloidal Photonic Crystals towards Fluorescence Enhancement of Quantum Dots

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Supplementary Figures

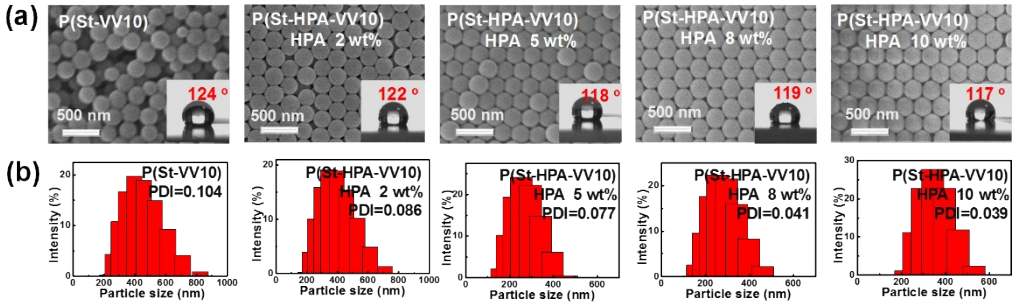

Fig. S1 (a) SEM images and (b) hydrodynamic diameter distributions of P(St-VV10) and P(St-HPA-VV10) colloidal particles with different HPA monomer concentration (0, 2, 5, 8, 10 wt%). Insets: static contact angle of the corresponding film.

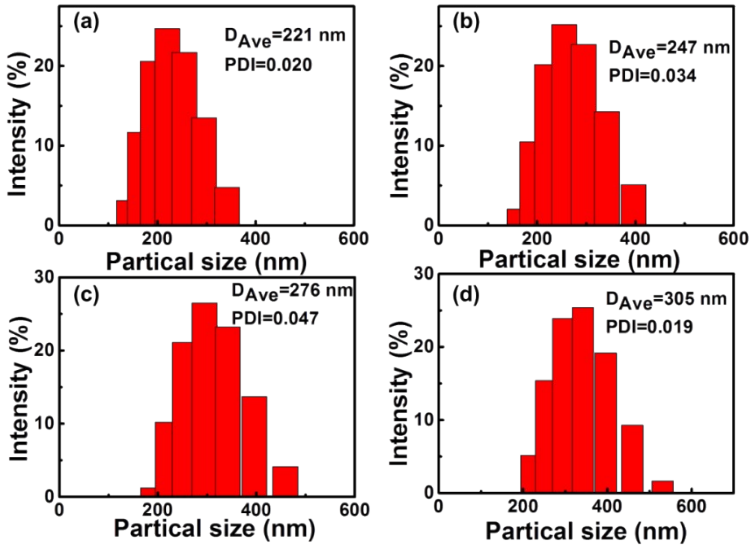

Fig. S2 Hydrodynamic diameter distribution of P(St-HPA-VV10) colloidal particles of (a) 221, (b) 247, (c) 276 and (d) 305 nm.

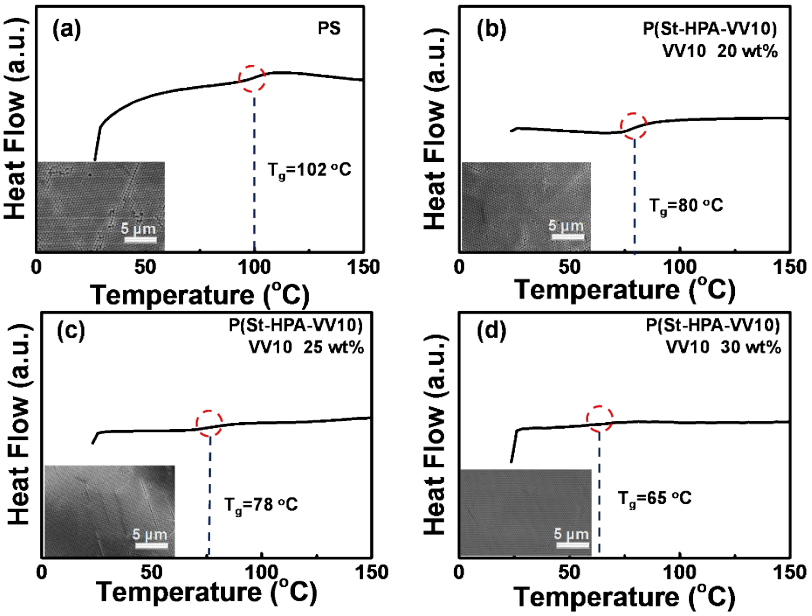

Fig. S3 DSC curves and SEM images of (a) pure PS and P(St-HPA-VV10) colloidal particles with VV10 monomer concentration of (b) 20 wt%, (c) 25 wt% and (d) 30 wt%.

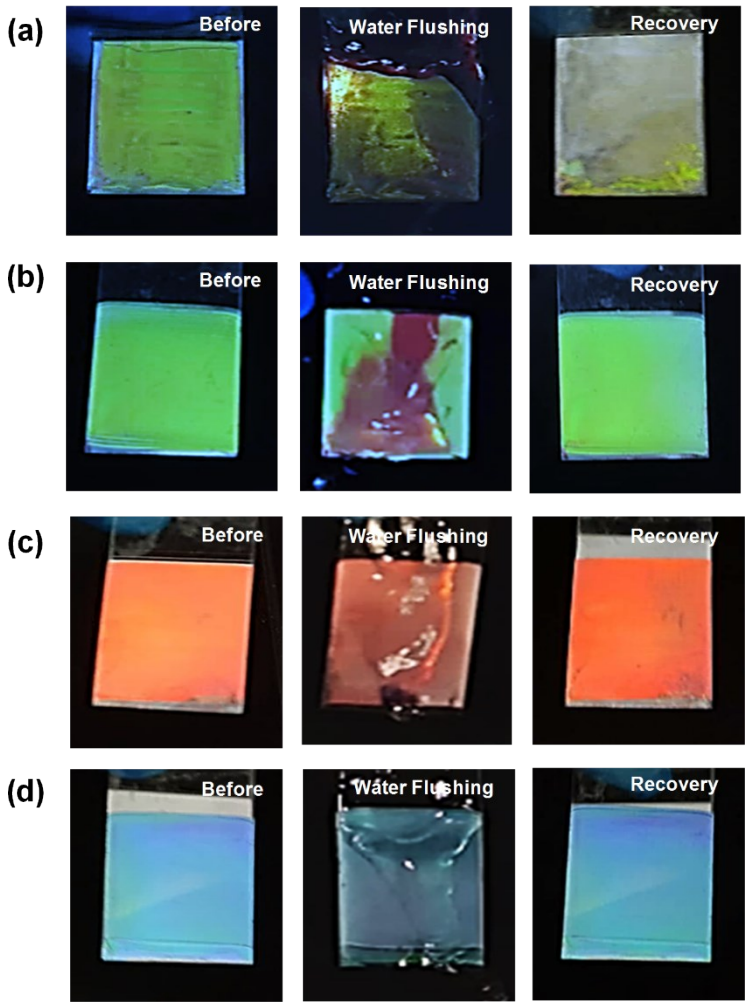

Fig. S4 Digital photographs of (a) pure PS CPCs film and P(St-HPA-VV10) CPCs film with VV10 monomer concentration of (b) 20 wt%, (c) 25 wt% and (d) 30 wt%.

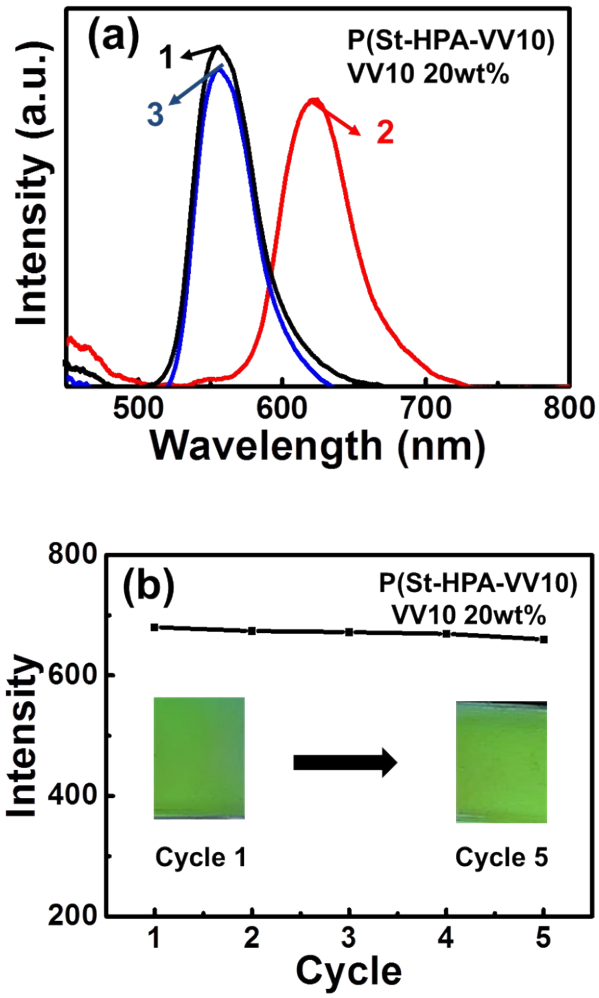

Fig. S5 (a) Reflection spectra of P(St-HPA-VV10) CPCs film (VV10, 20 wt%) before rinsing (black curve), after rinsing (red curve) and recovery (blue curve). (b) Reflection intensity and digital photographs of P(St-HPA-VV10) CPCs film (VV10, 20 wt%) for five water flushing treatment cycles.

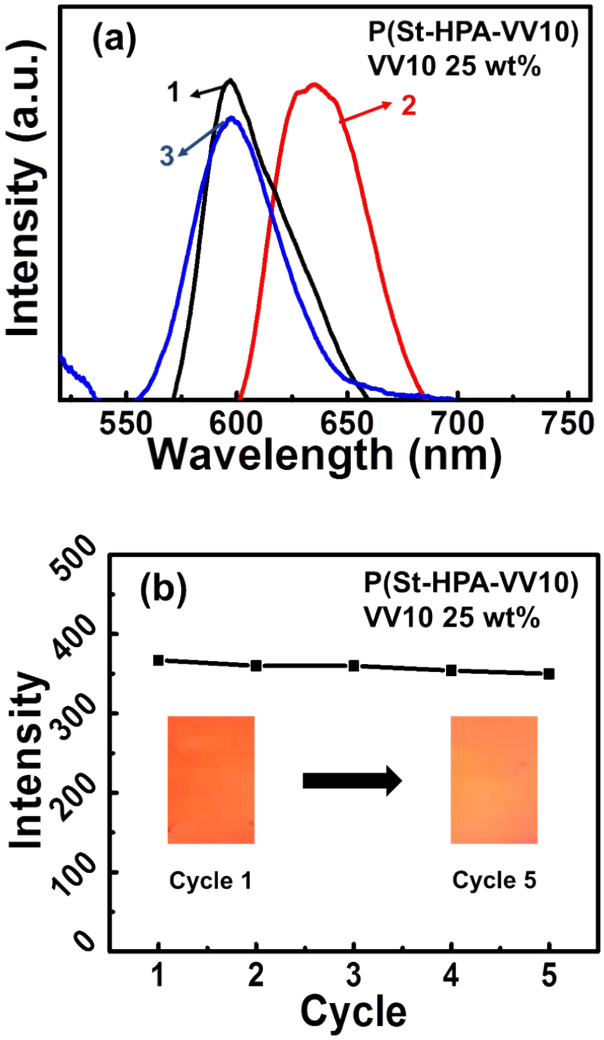

Fig. S6 (a) Reflection spectra of P(St-HPA-VV10) CPCs film (VV10, 25 wt%) before rinsing (black curve), after rinsing (red curve) and recovery (blue curve). (b) Reflection intensity and digital photographs of P(St-HPA-VV10) CPCs film (VV10, 25 wt%) for five water flushing treatment cycles.

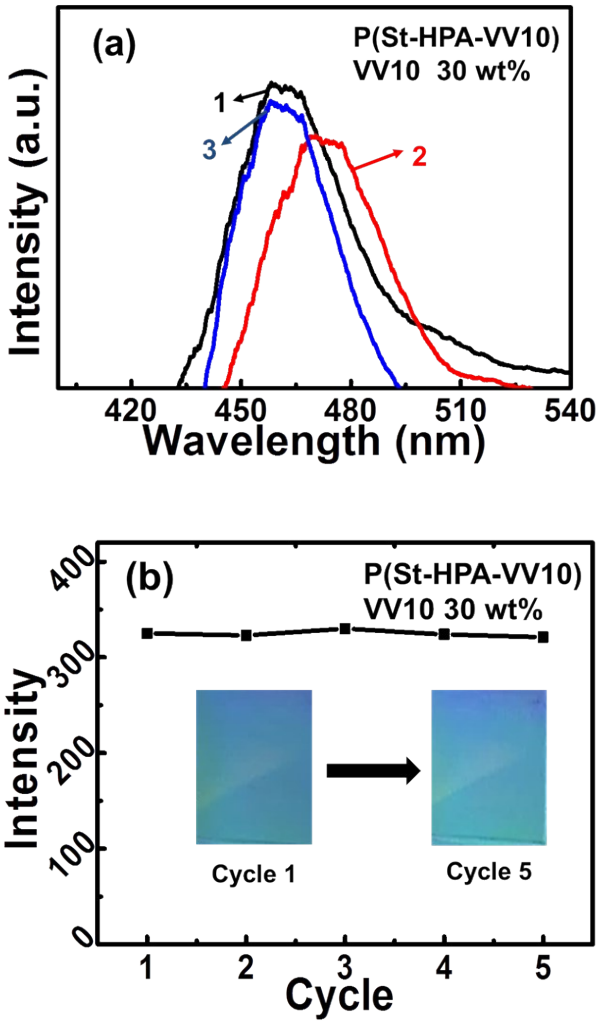

Fig. S7 (a) Reflection spectra of P(St-HPA-VV10) CPCs film (VV10, 30 wt%) before rinsing (black curve), after rinsing (red curve) and recovery (blue curve). (b) Reflection intensity and digital photographs of P(St-HPA-VV10) CPCs film (VV10, 30 wt%) for five water flushing treatment cycles.

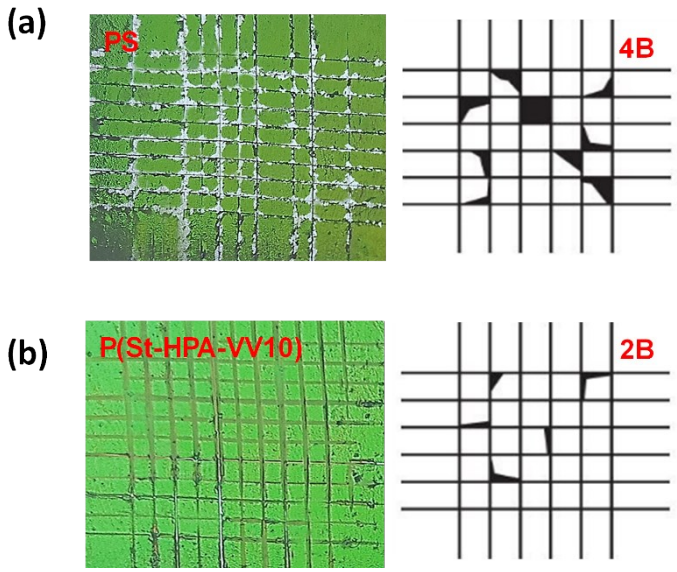

Fig. S8 Adhesion degree of (a) pure PS and (b) P(St-HPA-VV10) CPCs coating determined by scribe test.

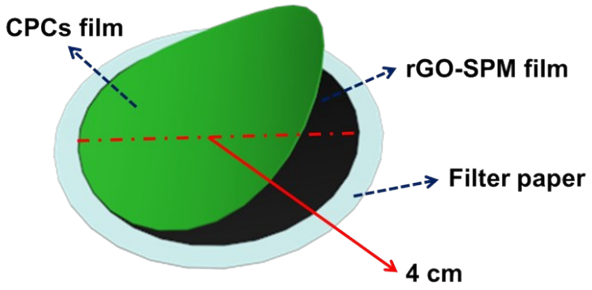

Fig. S9 Schematic illustration of rGO-SPM/P(St-HPA-VV10) CPCs film with angle-independent structural color.

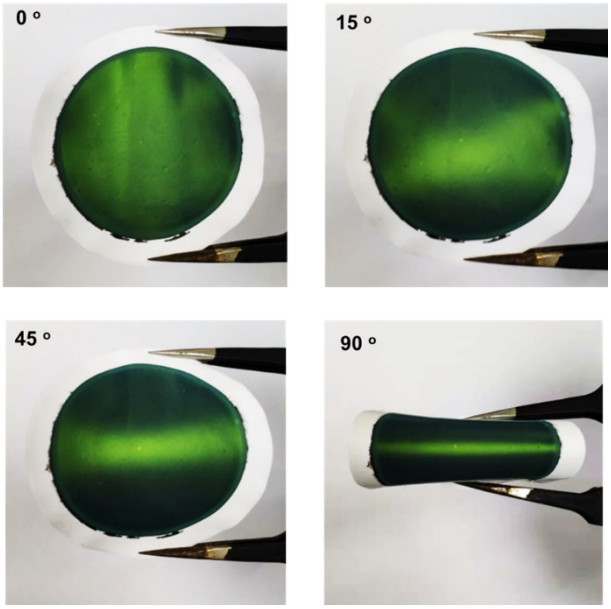

Fig. S10 Optical photographs of rGO-SPM/P(St-HPA-VV10) CPCs film at different bending angles of 0°, 15°, 45° and 90° (reflection peak centred at 545 nm).

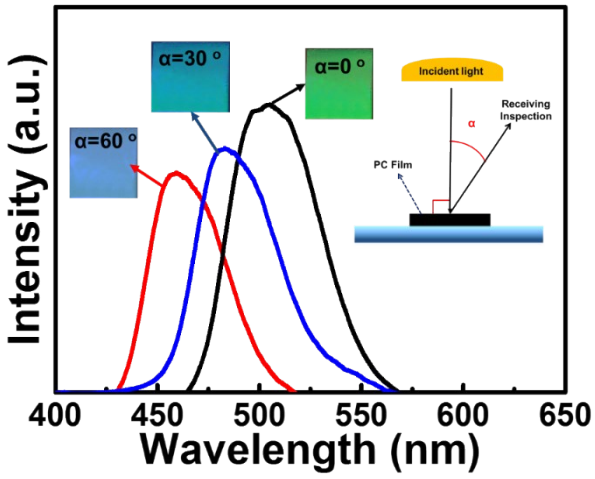

Fig. S11 Reflection spectra of angle-dependent P(St-HPA-VV10) CPCs film from different angle.

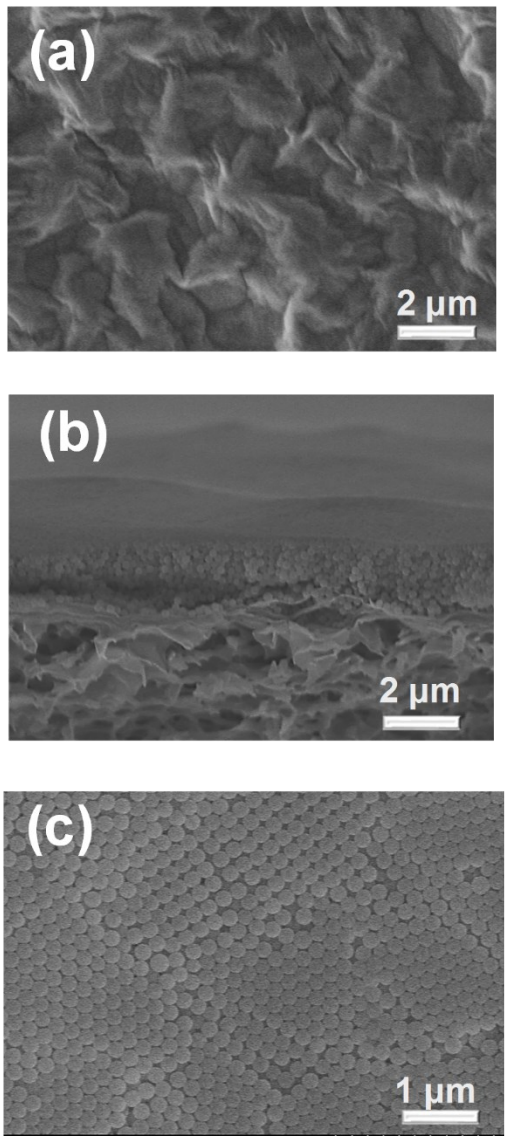

Fig. S12 SEM images of the surface of (a) rGO-SPM film, (b) cross-section of rGO-SPM/P(St-HPA-VV10) CPCs film and (c) surface of P(St-HPA-VV10) CPCs film.

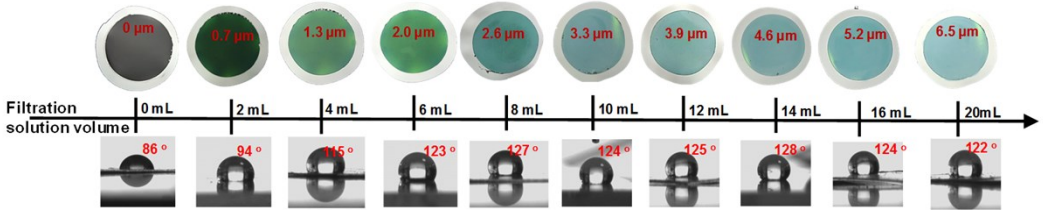

Fig. S13 Optical photographs of rGO-SPM/P(St-HPA-VV10) CPCs films with different CPCs thickness and corresponding static contact angles.

Theoretical film thickness calculation formula:

$$H_{film} = \omega . V_{latex} / S_{film}$$

Where H_{film} is the thickness of P(St-HPA-VV10) CPCs film, ω is the solid content of P(St-HPA-VV10) colloidal latex (here it is constant of 0.4 wt%), V_{latex} is filtration solution volume, S_{film} is the area of P(St-HPA-VV10) CPCs film (a constant of 12.56 cm^2).

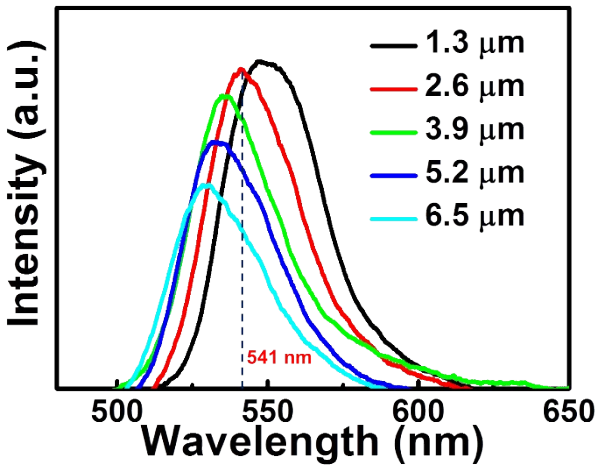

Fig. S14 Reflection spectra of CPCs films with different film thicknesses of 1.3 μm (black curve), 2.6 μm (red curve), 3.9 μm (green curve), 5.2 μm (blue curve) and 6.5 μm (azure curve).

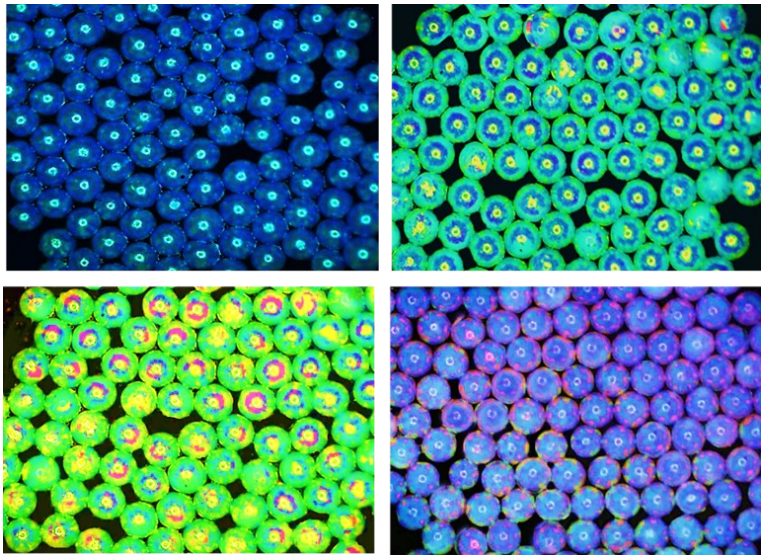

Fig. S15 Optical microscopy images of CPCs supraballs with reflection peak centred at 457 nm, 557 nm, 580 nm and 640 nm, respectively.

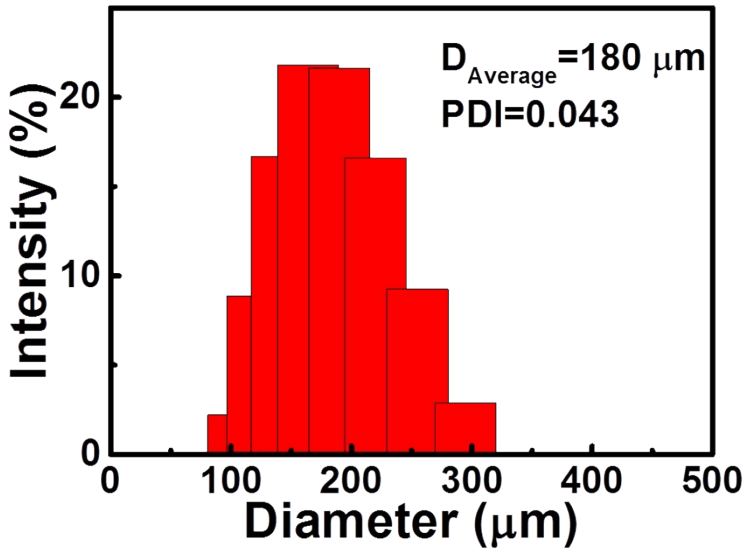

Fig. S16 Normalized size distribution of CPCs supraballs**.**

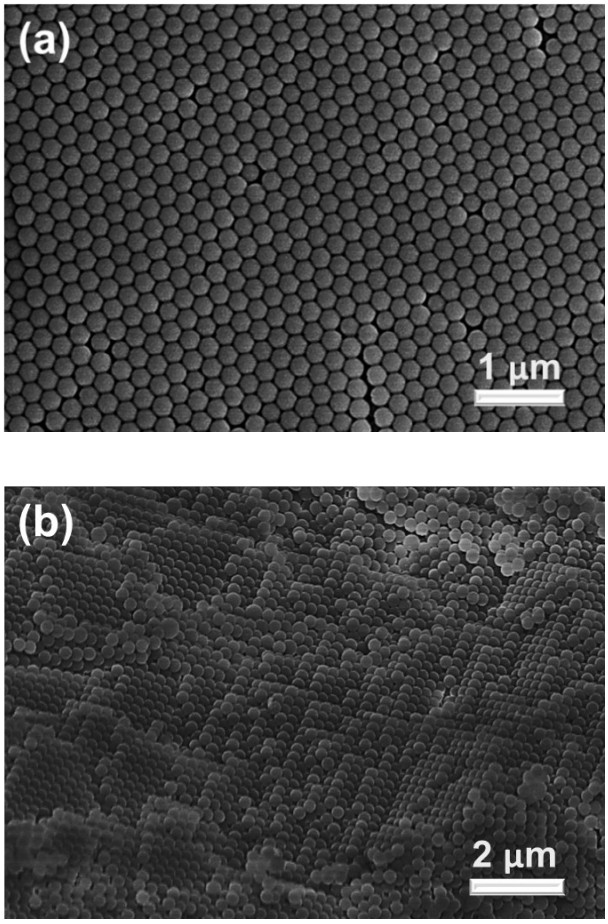

Fig. S17 SEM images of (a) the surface and (b) cross-section of the CPCs supraballs with blue structural color.

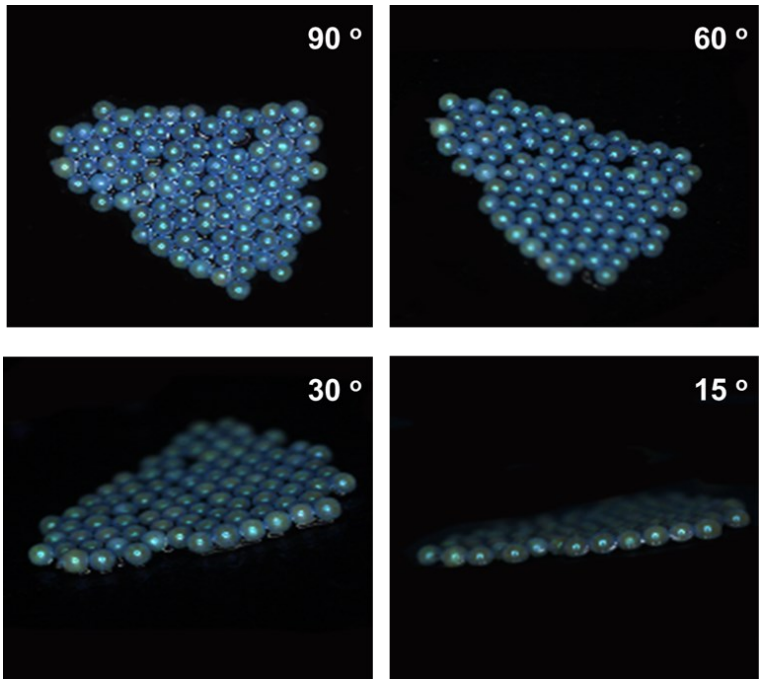

Fig. S18 Optical microscopy images of CPCs supraballs viewed at different angles.