

Supporting Information

Coordination-bond assisted fabrication of robust composite photonic crystal films through melt-compression

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Table S1. Recipes for preparing monodisperse PS spheres with various diameters

SDS solution (mL)	Diameter (nm)
2.6	175
2.2	205
1.8	220
1.2	250

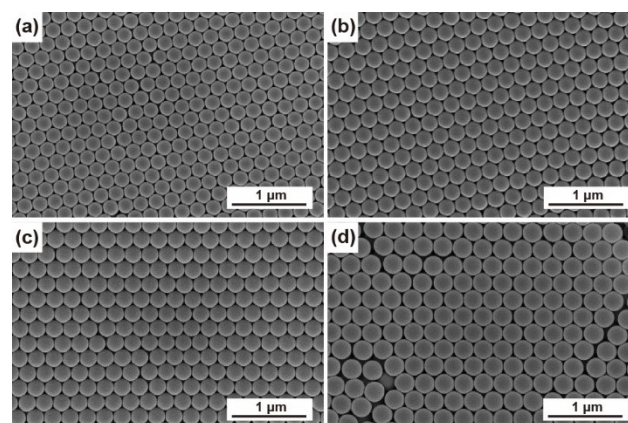


Figure S1. SEM images of monodisperse PS cores with different diameters: (a) 175 nm; (b) 205 nm; (c) 220 nm; (d) 250 nm

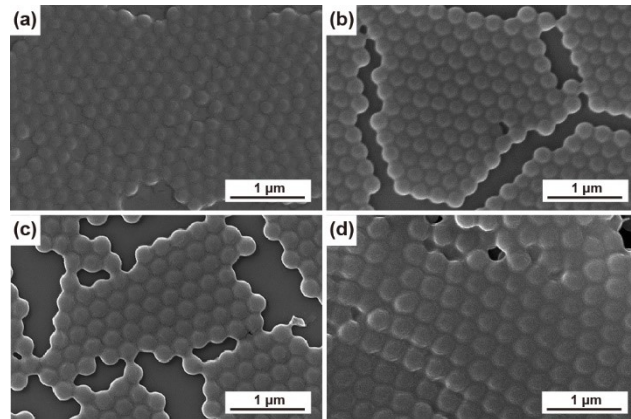


Figure S2. SEM images of monodisperse PS@PEA-PAA core-shell spheres with different diameters: (a) 225 nm; (b) 265 nm; (c) 280 nm; (d) 310 nm. The diameter of PS cores for core-shell spheres are 175 nm, 205 nm, 220 nm and 250 nm, respectively.

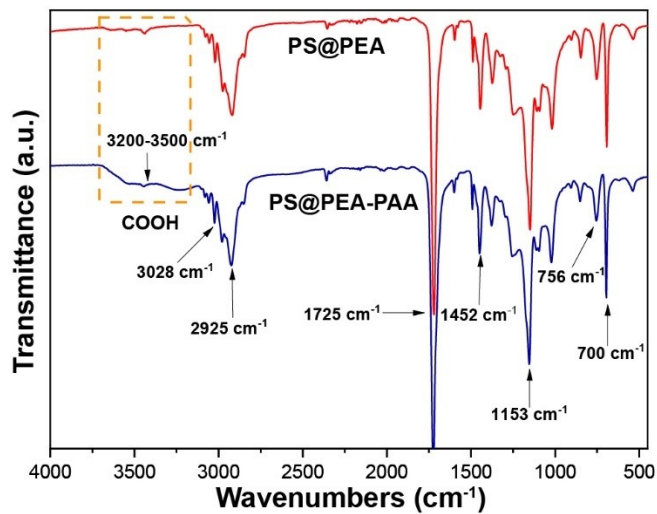


Figure S3. FTIR spectra of PS@PEA and PS@PEA-PAA spheres

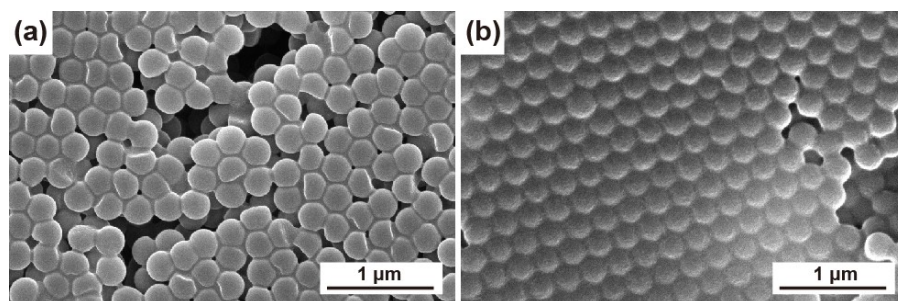


Figure S4. SEM images of core-shell polymer spheres with different PS cores: (a) uncross-linked PS cores; (b) cross-linked PS cores

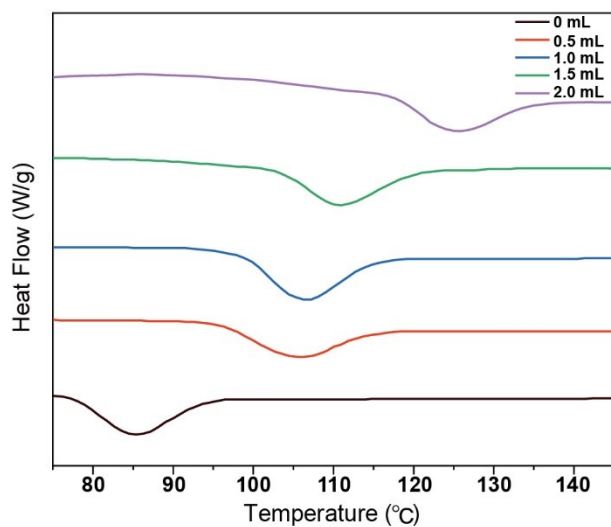


Figure S5. Effect of different BDDA dosage on the glass transition temperatures of PS cores

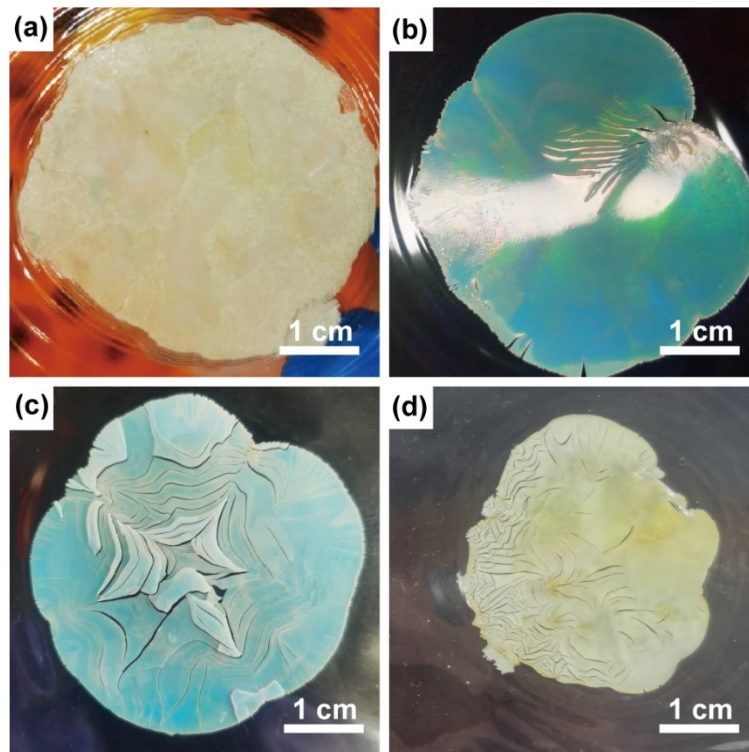


Figure S6. Digital photographs of composite films prepared by adding different metal salts: (a) AlCl_3 ; (b) CaCl_2 ; (c) CsCl ; (d) CeCl_3

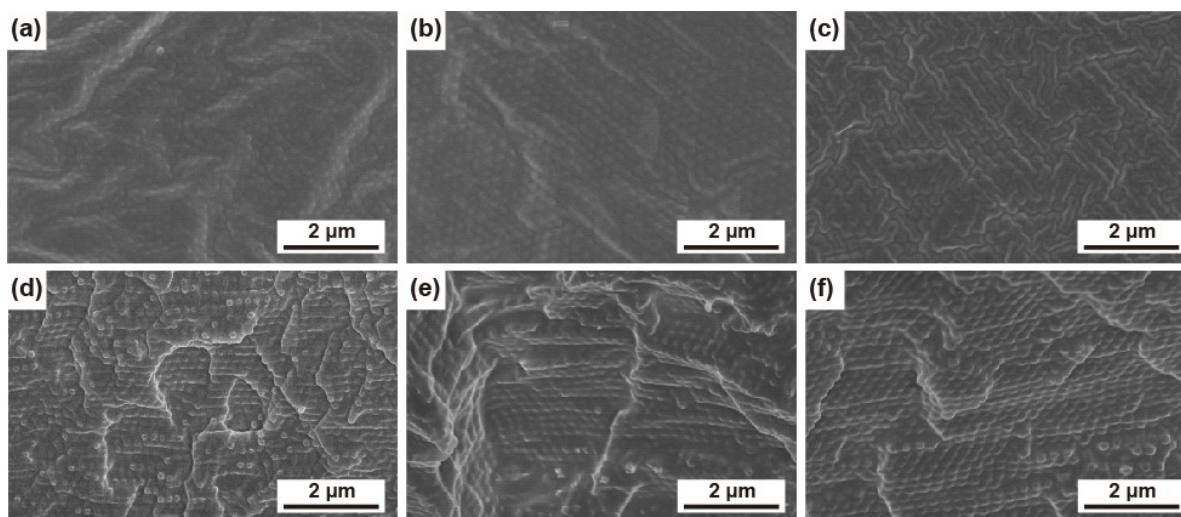


Figure S7. (a-c) SEM images of PC films fabricated using 225 nm, 265 nm and 310 nm PS@PEA-PAA CS spheres as building blocks with 1 mmol ZnCl_2 added into the precursor, respectively.; (d-f) are cross-sectional SEM images of (a-c), respectively.

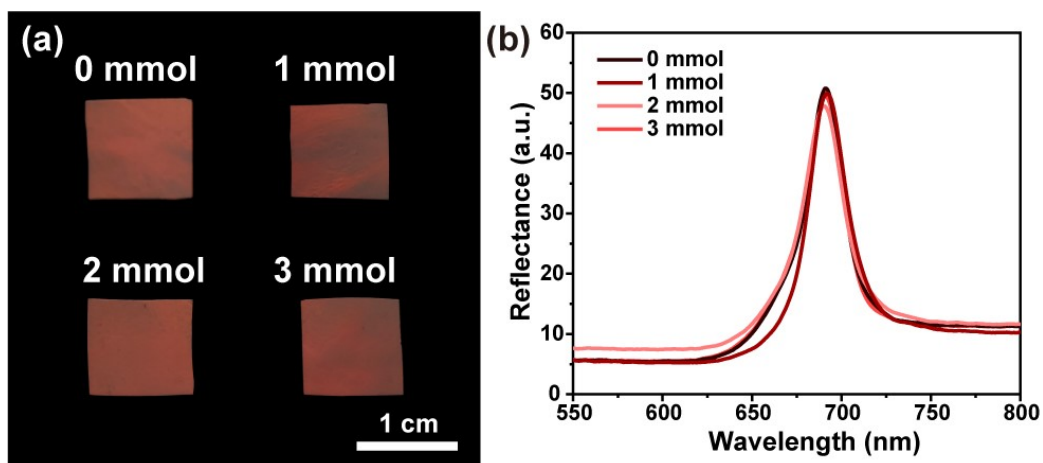


Figure S8. (a) Digital photographs of PC films fabricated with 310 nm PS@PEA-PAA CS spheres as building blocks and various amount of ZnCl₂ added into the precursor; (b) reflectance spectra of corresponding PCs in (a)

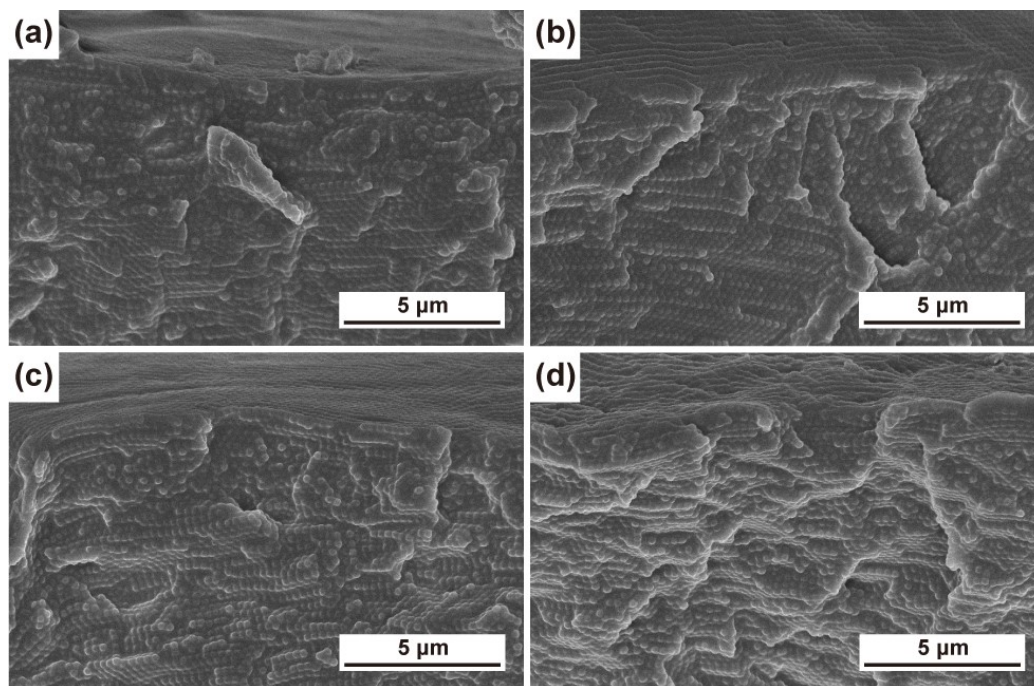


Figure S9. SEM images of PC films fabricated with 310 nm PS@PEA-PAA CS spheres as building blocks and various amount of ZnCl₂ added into the precursor: (a) 0 mmol; (b) 1 mmol; (c) 2 mmol; (d) 3 mmol

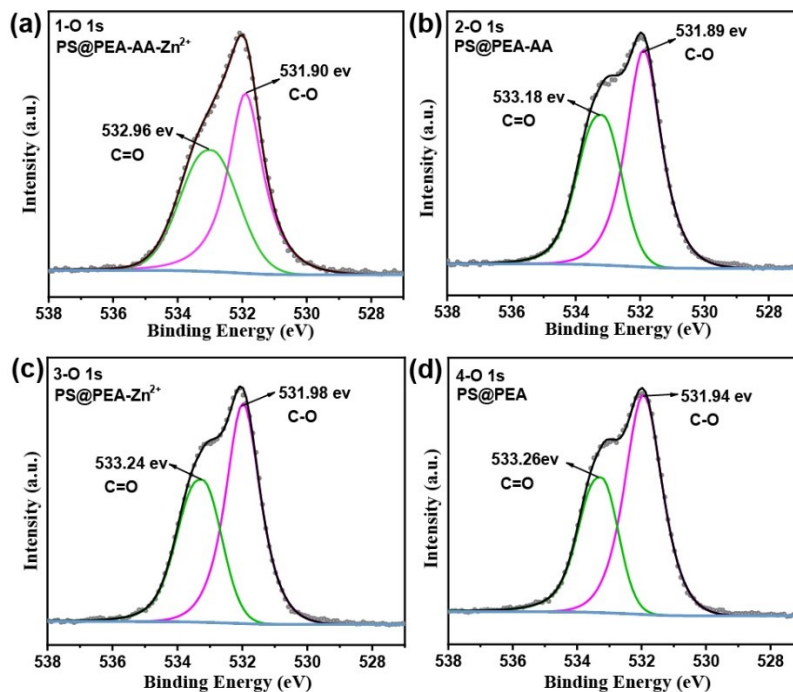


Figure S10. XPS spectra of PC films from various precursors: (a) PS@PEA-PAA and Zn^{2+} composite; (b) PS@PEA-PAA spheres; (c) PS@PEA and Zn^{2+} composite; (d) PS@PEA spheres

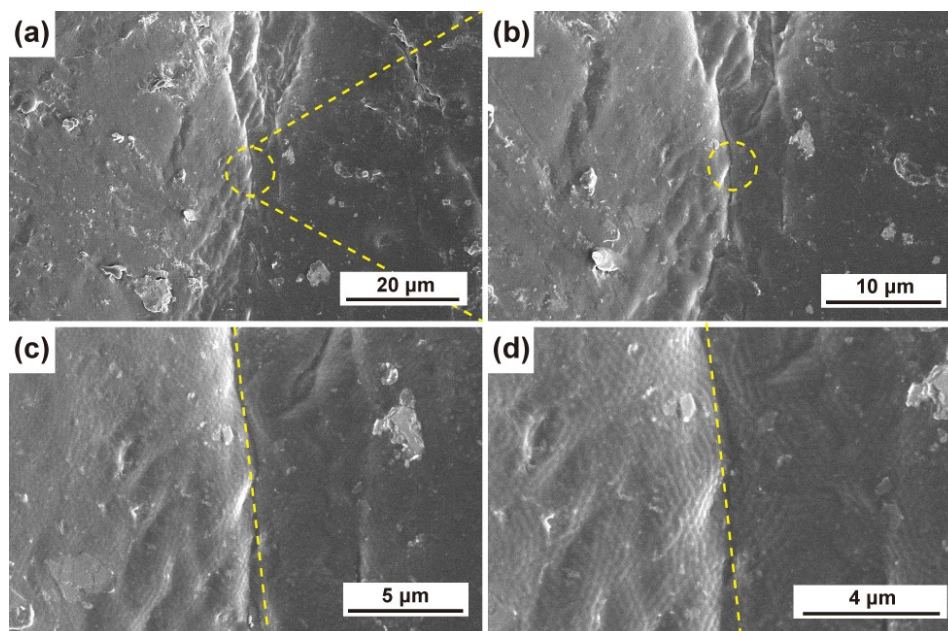


Figure S11. SEM images of the combined section of a composite PC film from red and blue PC films with various magnification times

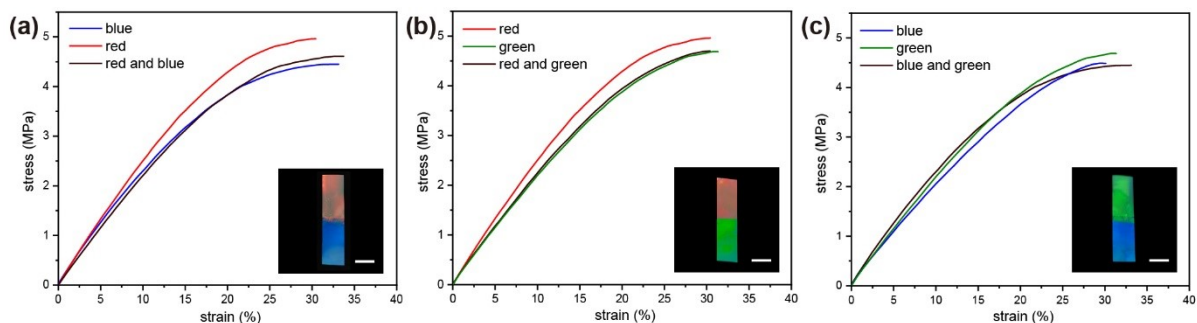


Figure S12. Strain-stress curves of three combined composite PC films with their component films with single colors as references: (a) red and blue film; (b) red and green film; (c) blue and green film. The insets are digital photographs of corresponding combined composite PC films with the scale bar being 1 cm.

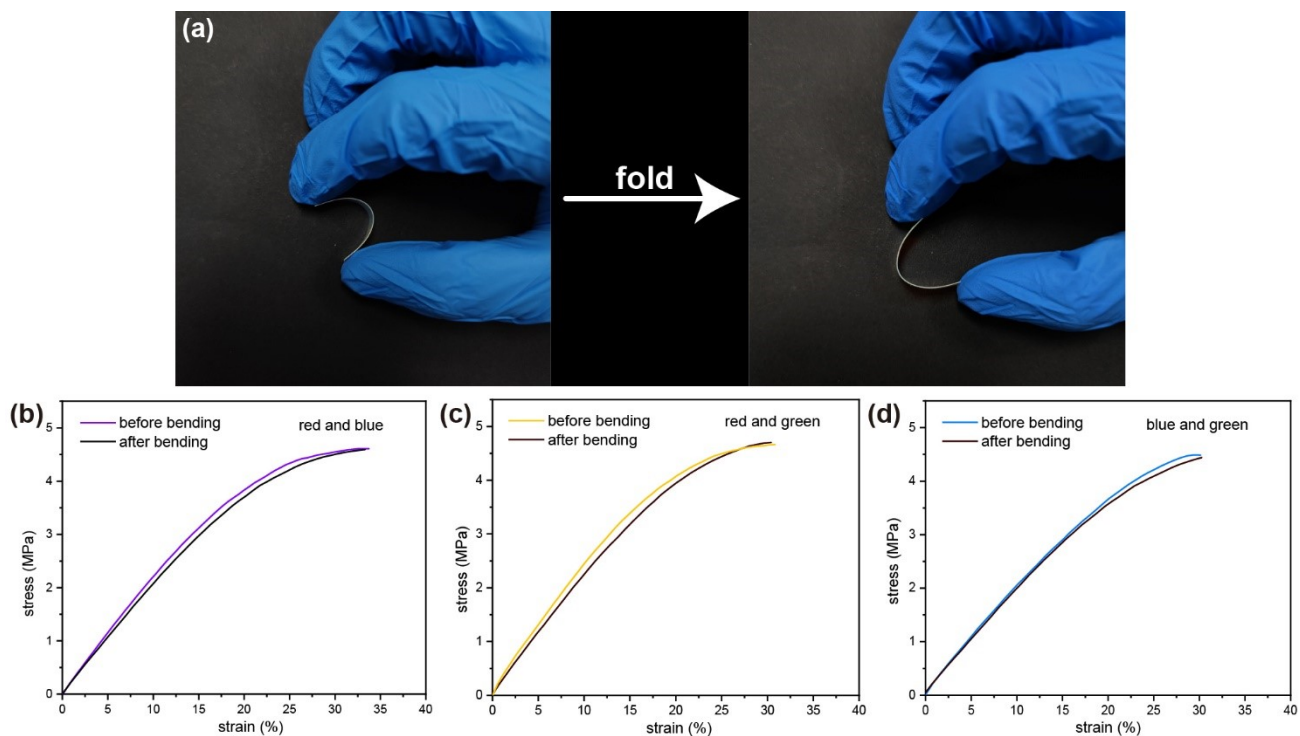


Figure S13. (a) Digital photographs demonstrating bending operations; Strain-stress curves of combined composite PC films before and after bending for 100 times: (b) red and blue films; (c) red and green films; (d) blue and green films

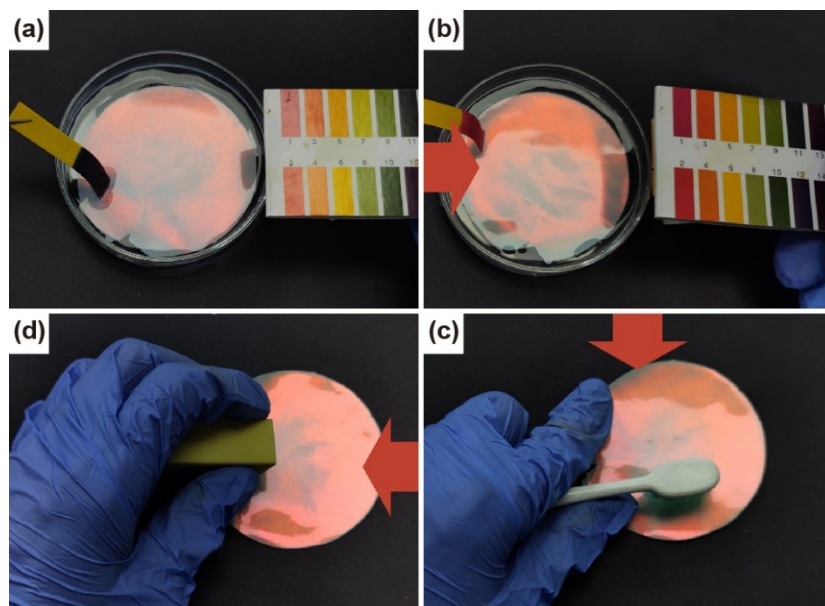


Figure S14. Digital photographs of a red composite PC film (a,b) soaked in basic solution (pH=12) and acid solution (pH=2) for 2 h; (c) brushed and (d) rubbed for 100 times