Supporting Information

Magnetic assembly and manipulation of Janus photonic crystal supraparticles from a colloidal mixture of spheres and ellipsoids

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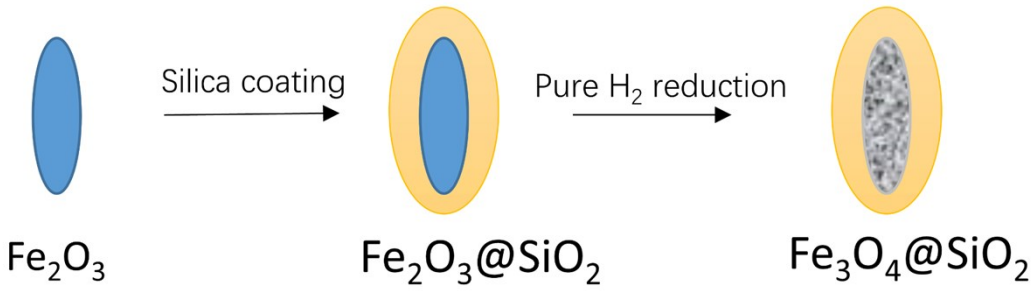

Fig. S1 Schematic illustration of the preparation process of $Fe_3O_4@SiO_2$ nanoellipsoids.

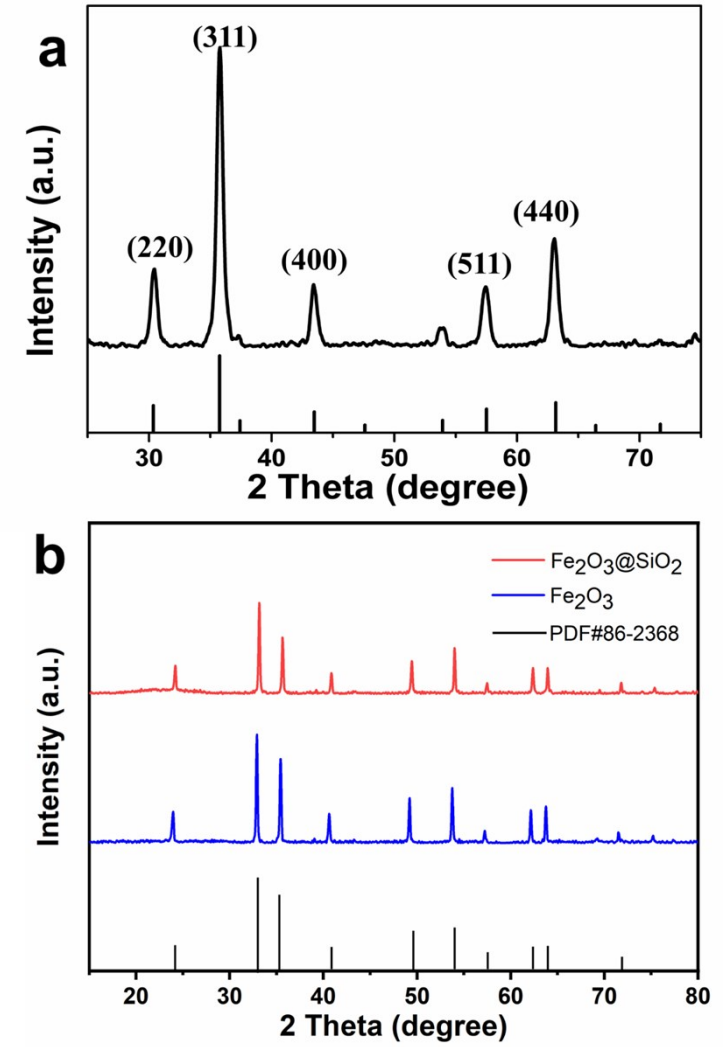

Fig. S2 XRD patterns of (a) Fe_3O_4@SiO_2, and (b) α-Fe_2O_3 and α-Fe_2O_3@SiO_2 nanoellipsoids.

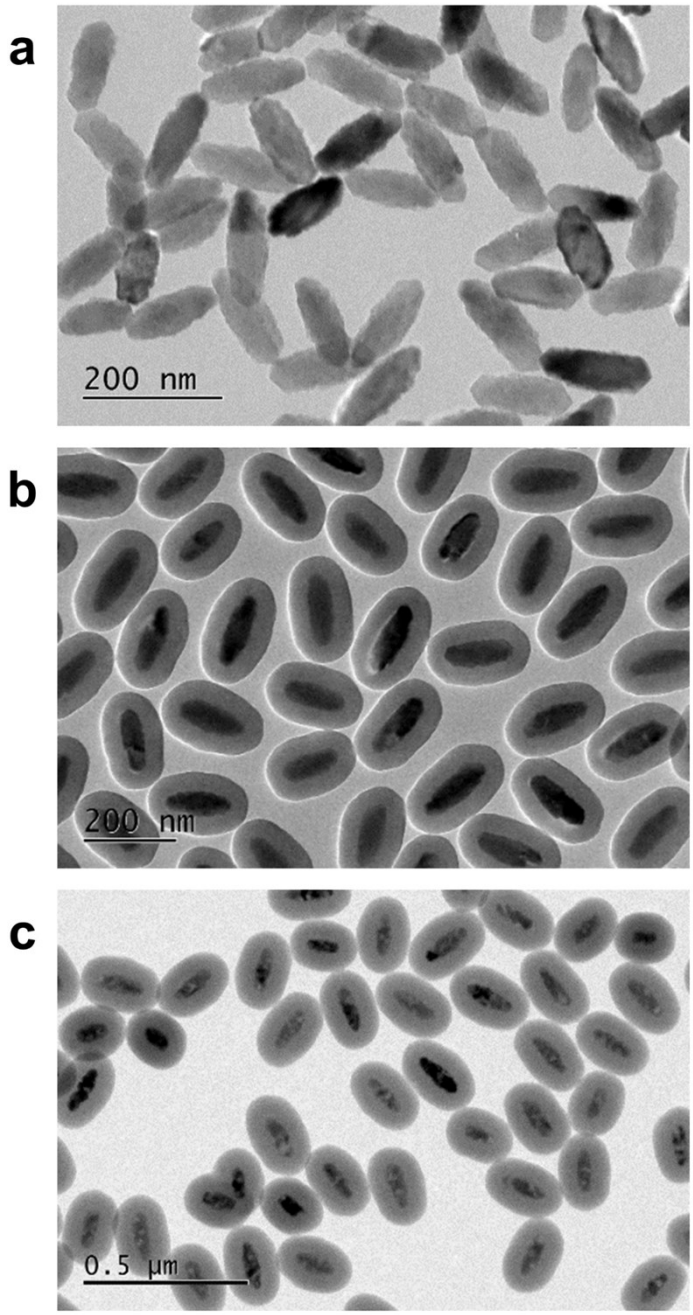

Fig. S3 TEM images of (a) α-Fe_2O_3, (b) α-Fe_2O_3@SiO_2 and (c) Fe_3O_4@SiO_2 nanoellipsoids.

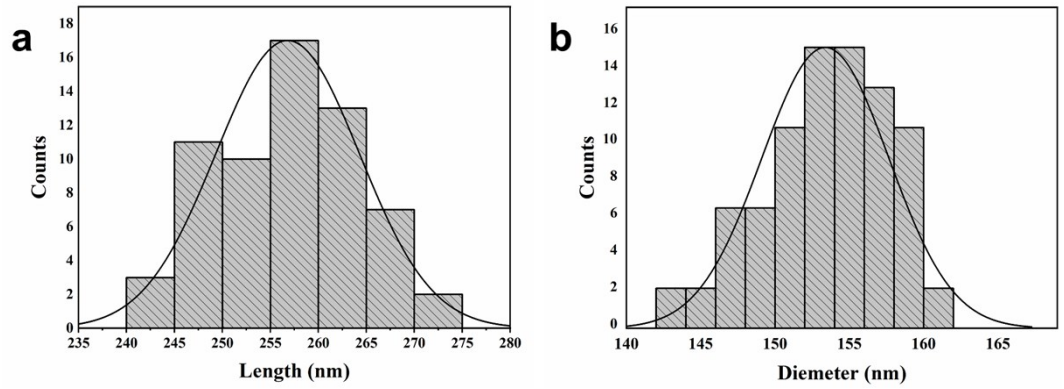

Fig. S4 Size distribution of Fe_3O_4@SiO_2 nanoellipsoids. (a) Their average length, obtained by measuring 100 particles, is 255±10 nm. (b) Their average diameter, obtained by measuring the same 100 particles, is 155±5 nm.

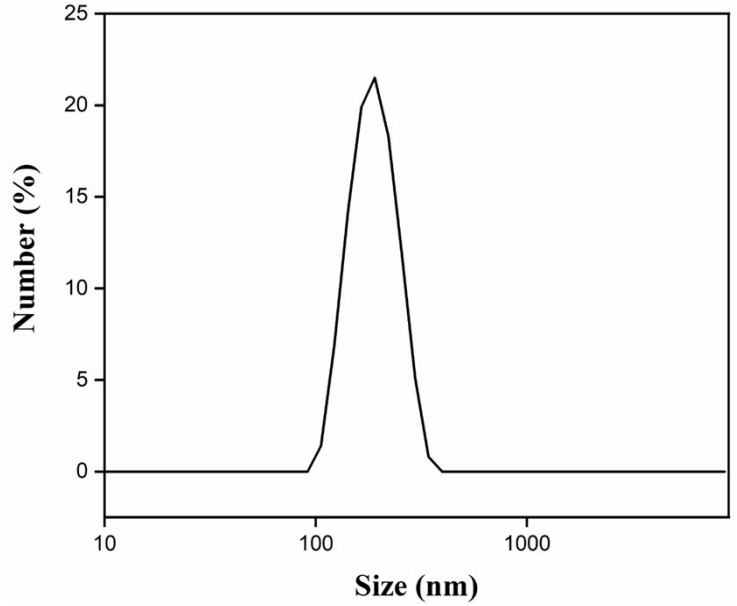

Fig. S5 DLS curve of Fe_3O_4@SiO_2 aqueous dispersion.

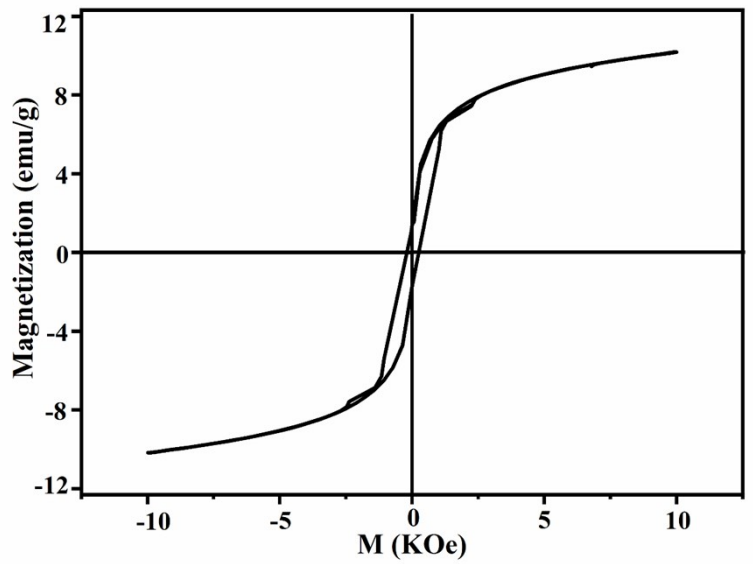

Fig. S6 Hysteresis loop of the Fe_3O_4@SiO_2 nanoellipsoids at room temperature.

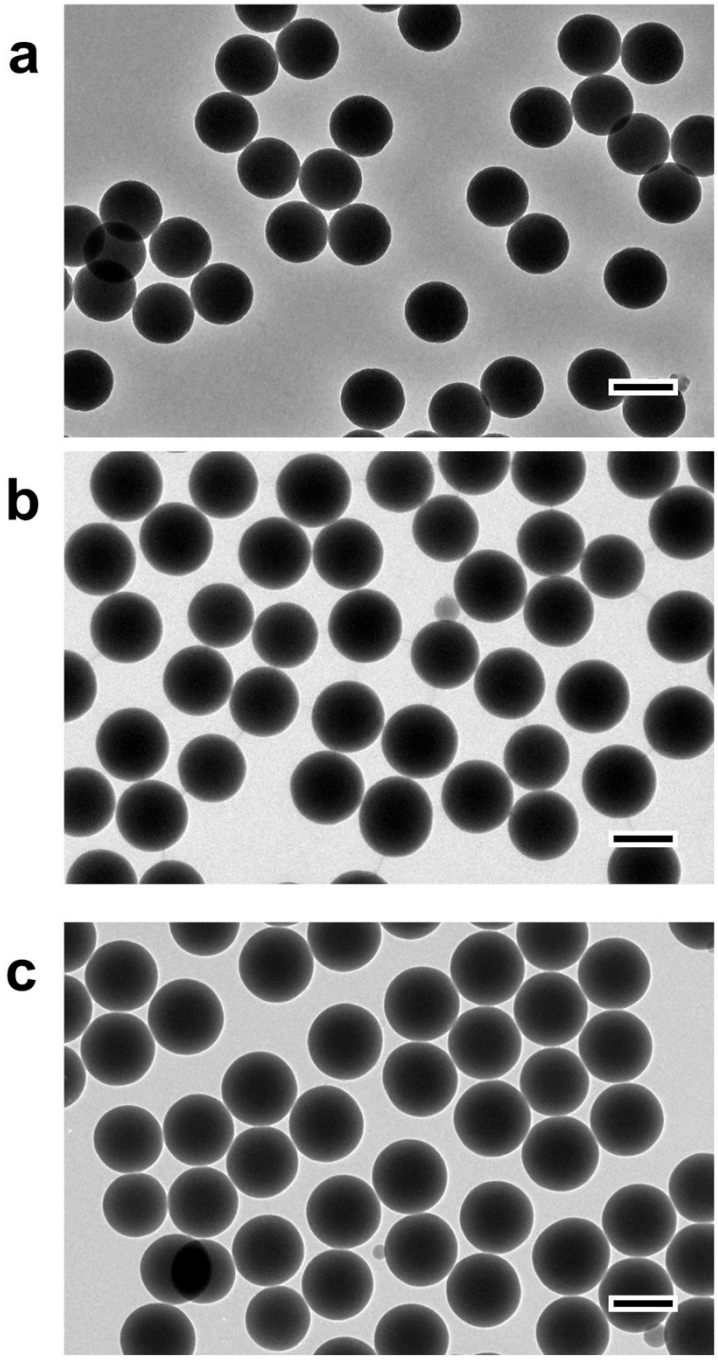

Fig. S7 TEM images of SiO_2 nanospheres of different sizes: (a) 220 nm, (b) 260 nm, (c) 300 nm. Scale bars are 200 nm.

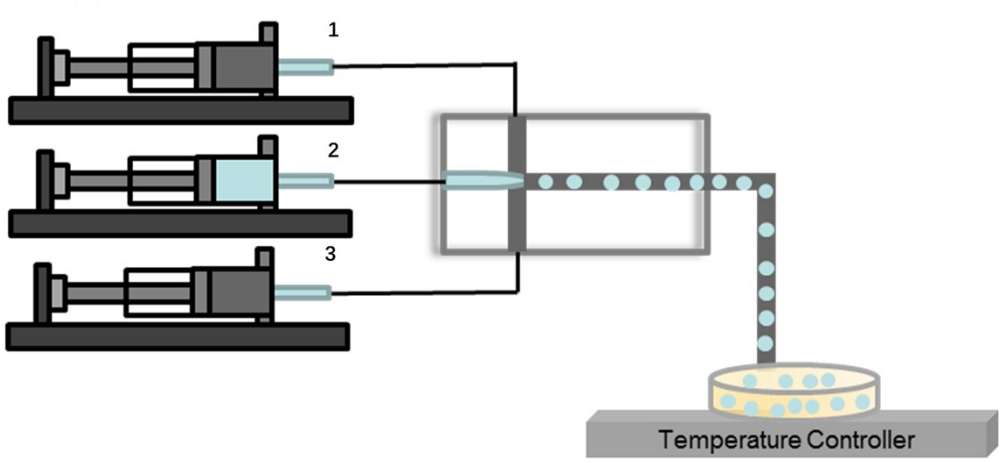

Fig. S8 The microfluidic device for the generation of droplets.

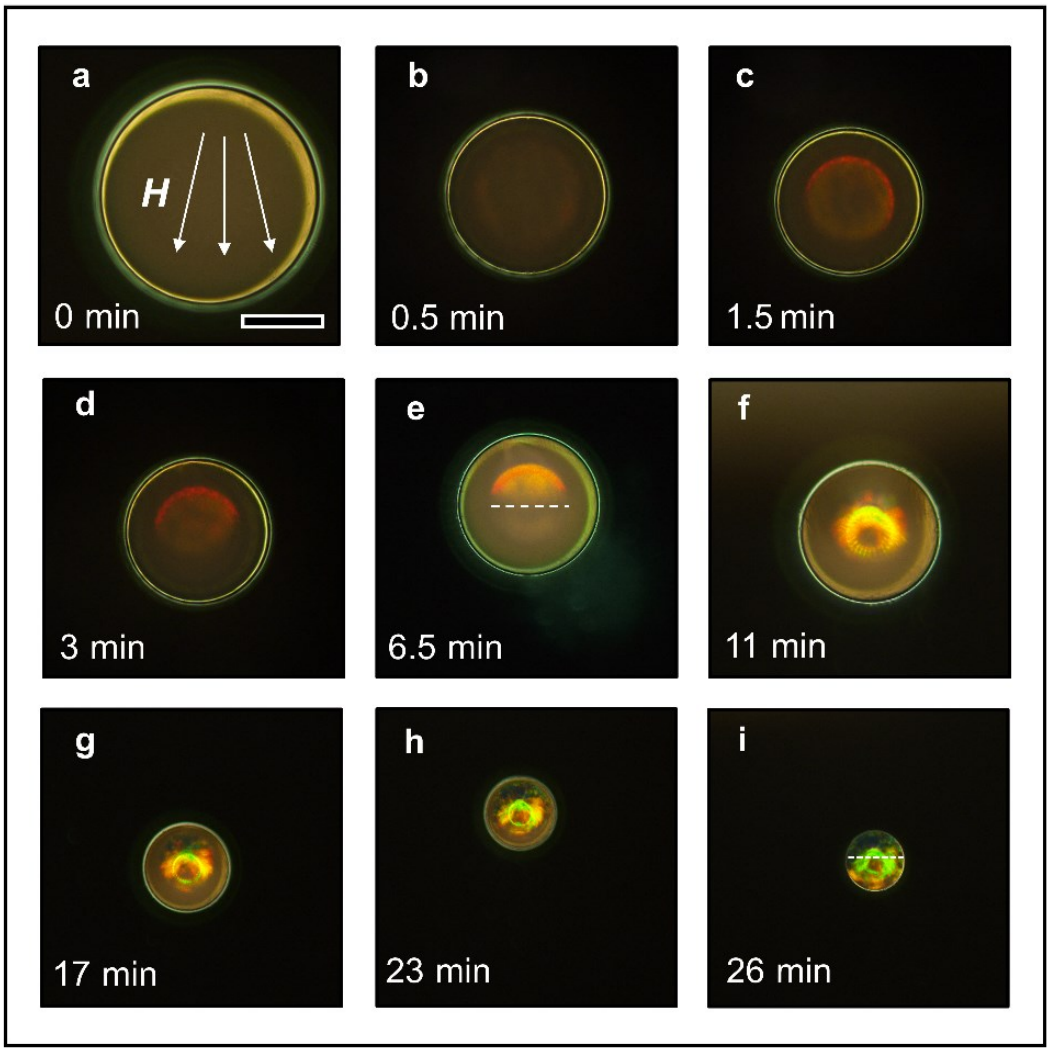

Fig. S9 Optical microscopy images showing the assembly process of a single droplet under the horizontal magnetic field. Scale bar is 100 μm.

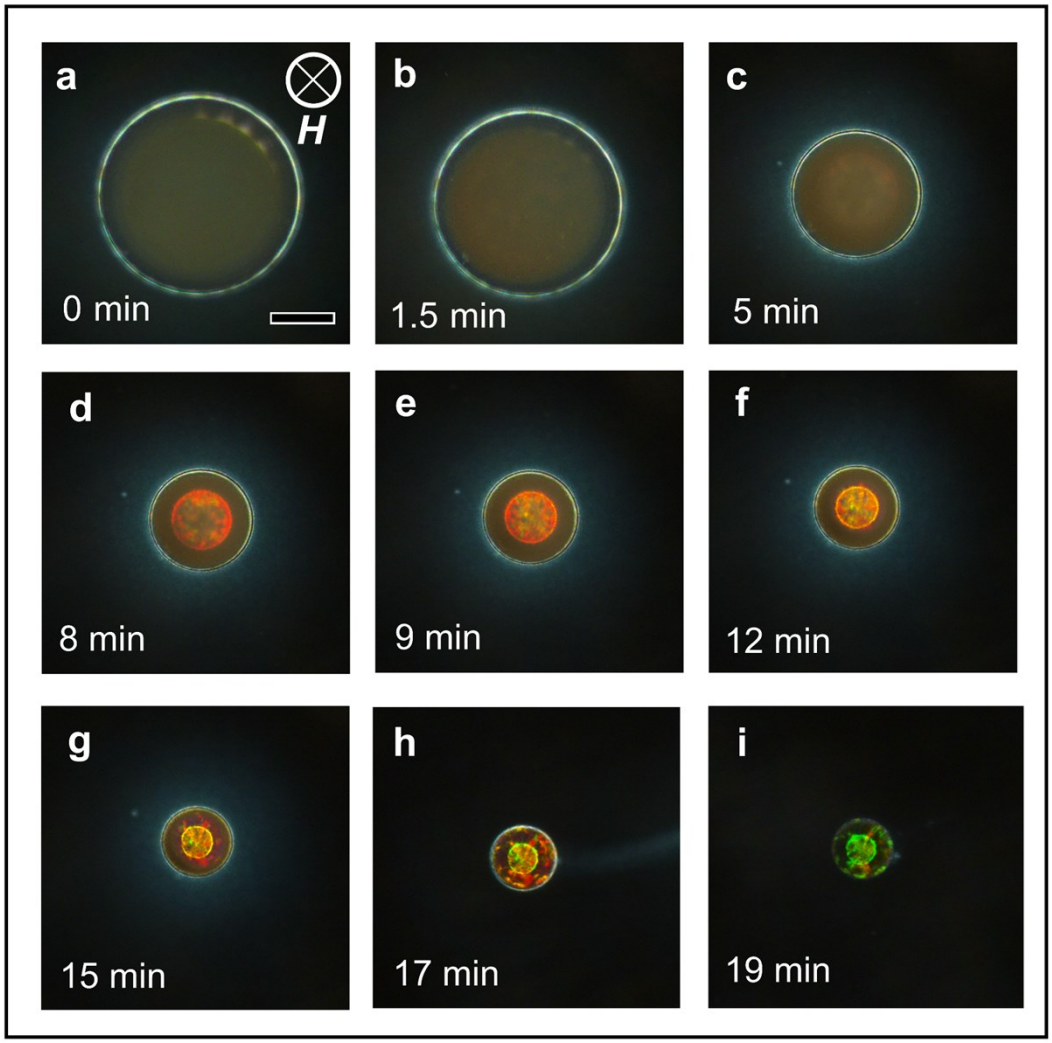

Fig. S10 Optical microscopy images showing the assembly process of a single droplet under the vertical magnetic field. The field strength decreased from the bottom to the top. Scale bar is 100 μm.

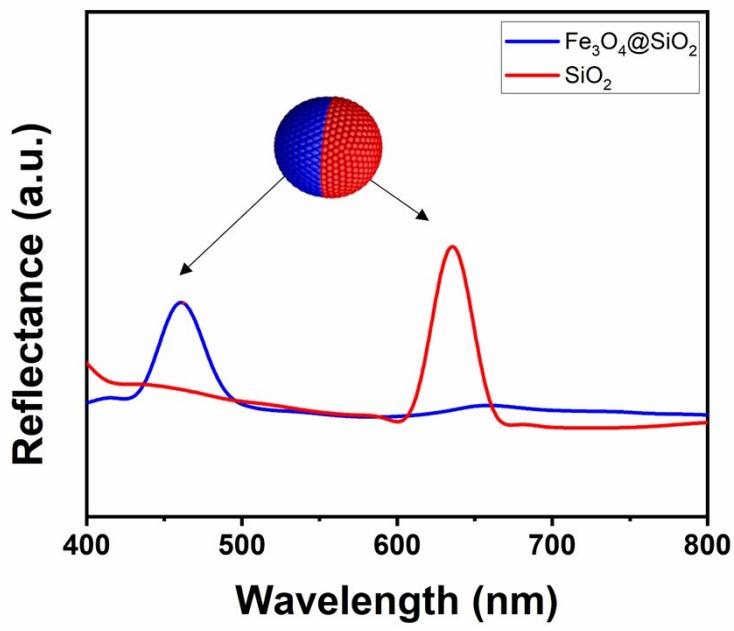

Fig. S11 Reflection spectra of the two parts of a supraparticle.

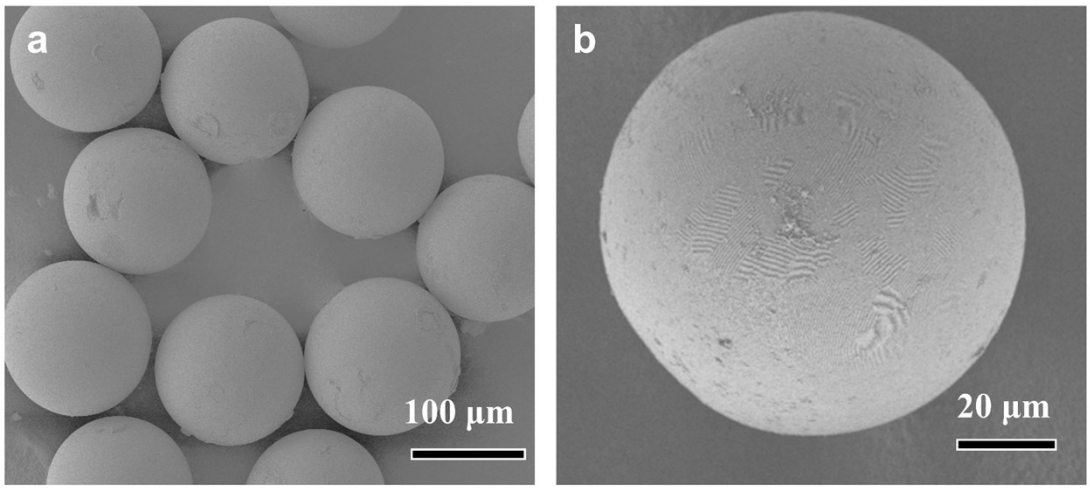

Fig. S12 SEM images of Janus PCSs.

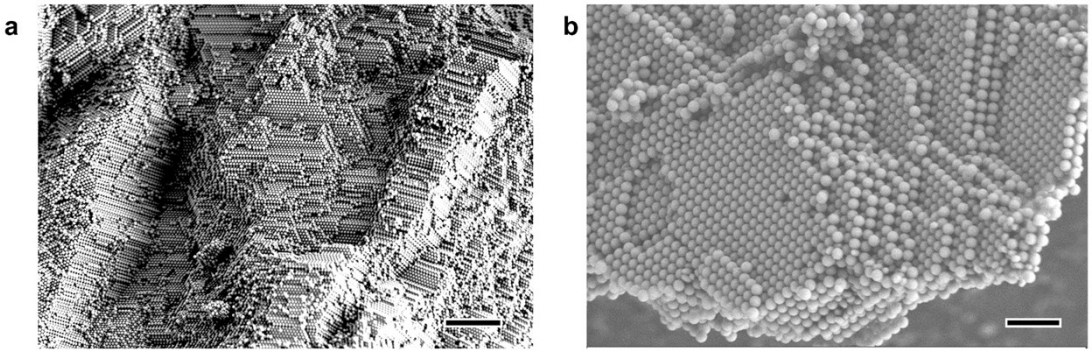

Fig. S13 SEM images of the SiO_2 part from a broken supraparticle. Scale bars are 5 μm for (a) and 1 μm for (b).

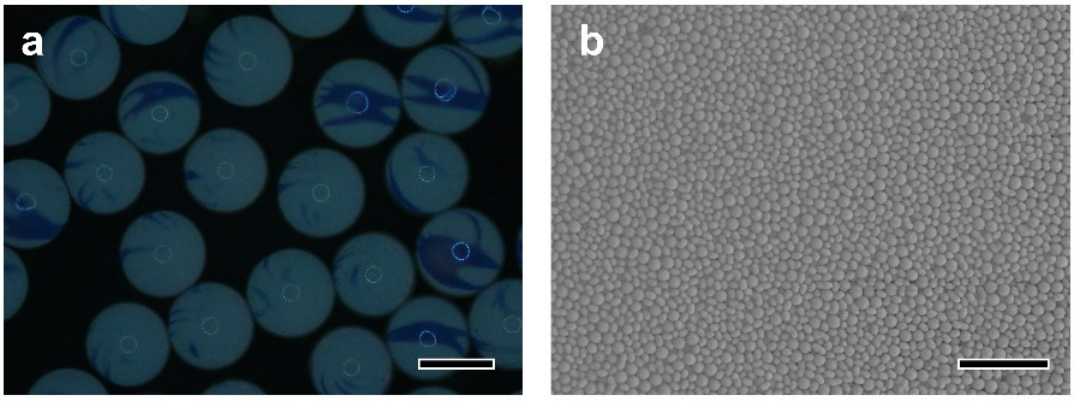

Fig. S14 (a) Optical microscopy and (b) SEM images of supraparticles dried in the absence of magnetic fields. Scale bars are 100 μm for (a) and 1 μm for (b).

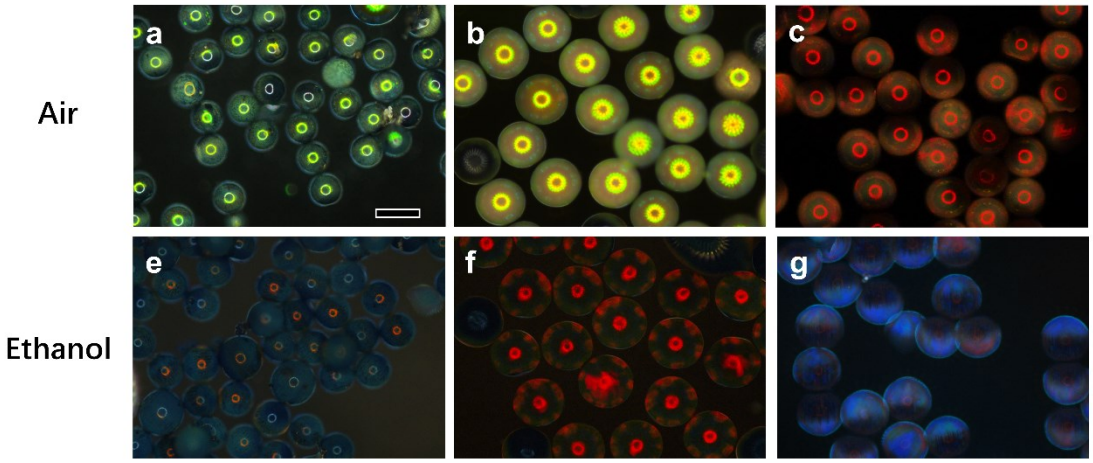

Fig. S15 Dark-field optical microscope images of supraparticles made up of different sizes SiO_2. Scale bar is 100 μm.

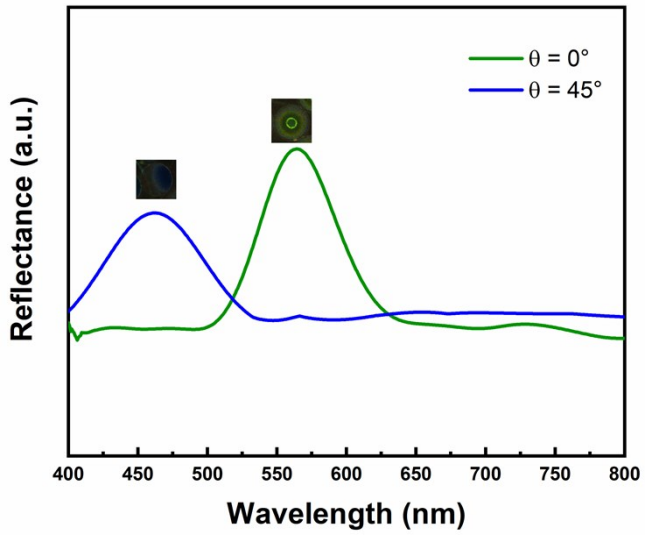

Fig. S16 Reflection spectra of supraparticles in respons to magnetic fields with different directions.

Supporting Information

Supplementary Video

Video S1 Magnetic tuning of structural color of the free-standing supraparticles.