Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Journal of Materials Chemistry C

PAPER

Supporting Information

Eccentric 1-D Magnetic Core-Shell Photonic Crystal Balls: Ingenious Fabrication and Distinctive Optical Properties

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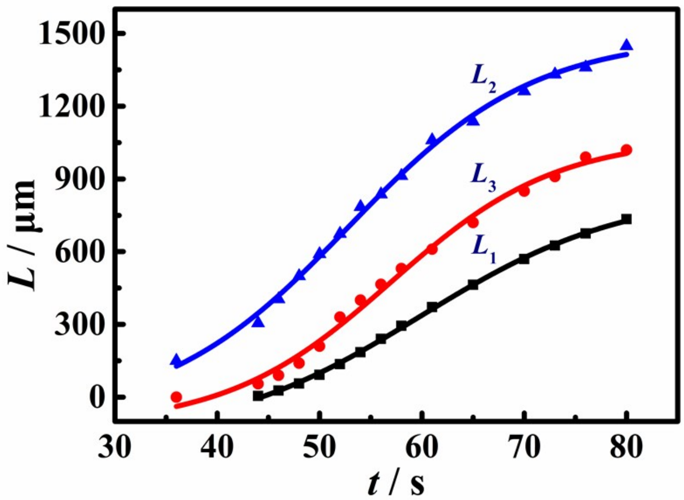

Fig. S1 The change of shell thickness L_1, L_2 and L_3 with the UV light irradiation time (*t*).

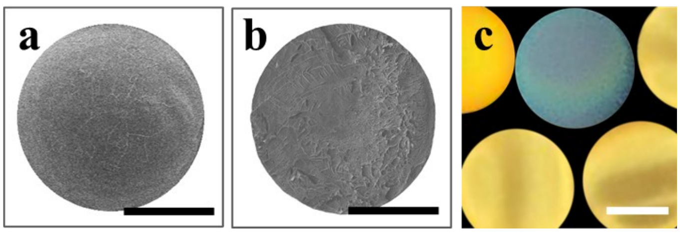

Fig. S2 SEM images of (a) the sample obtained at *t* of 82 s and (b) its corresponding central cross-section along the direction incident light, indicating that the droplet template was completely polymerized into a solid ball. (c) Digital photo, indicating that the completely polymerized PCB sample dispersed in water displays various colors, suggesting that they cannot be self-oriented along the magnetic nanochain structures. The bars are all 2 mm.

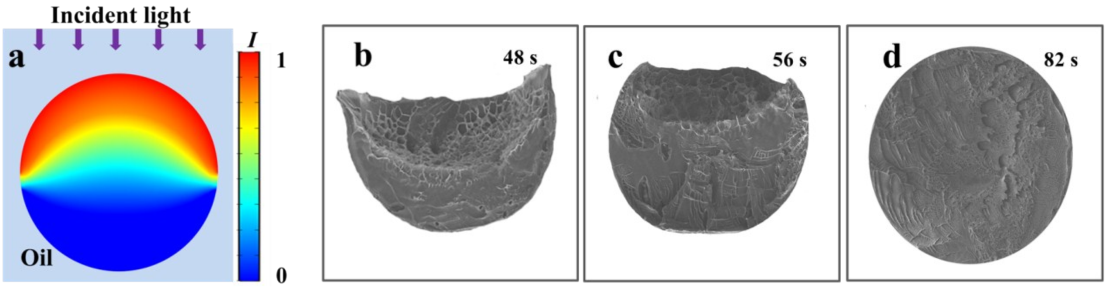

Fig. S3 (a) Simulated time-averaged energy distribution in a droplet template dispersed in a container with black bottom when it was radiated by a beam of UV light from the top; (b-d) SEM images of the central cross-sectional samples along the incident light direction, which are obtained at different *t*.

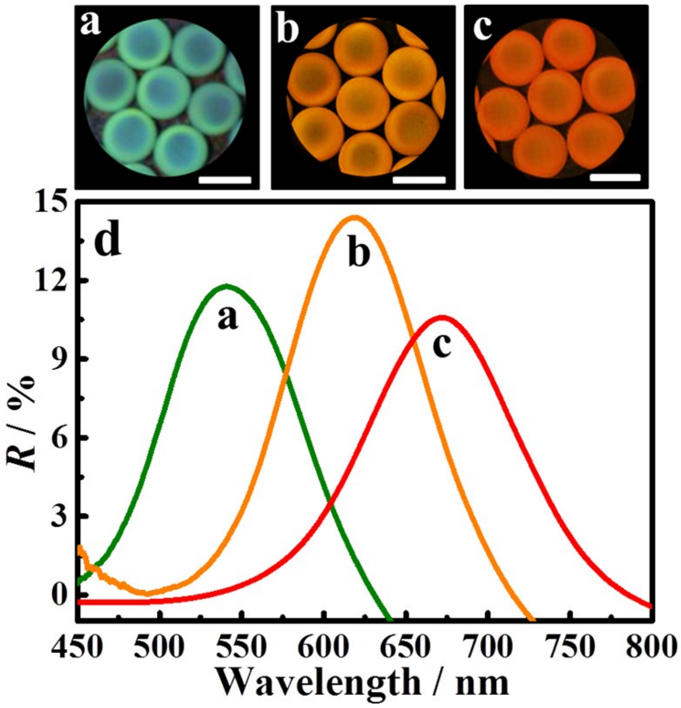

Fig. S4 (a-c) Digital photos of the eccentric 1-D magnetic core-shell PCBs prepared under different *H* of (a) 550 Gs, (b) 400 Gs and (c) 300 Gs, and (d) the corresponding reflection spectra. The bars are 2 mm.

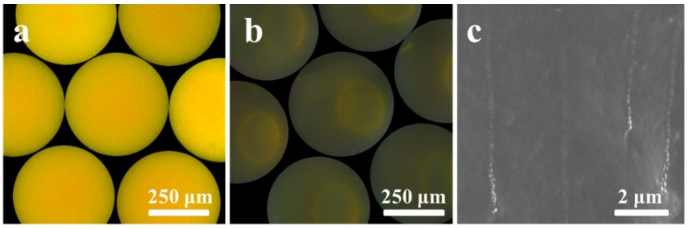

Fig. S5 Eccentric 1-D magnetic core-shell PCBs with a size of micrometers prepared under *H* of 550 Gs: (a) digital photo for them without *H*, (b) digital photo for them under *H* vertical to the observation direction and (c) SEM image of a cross-section zone in outer shell.

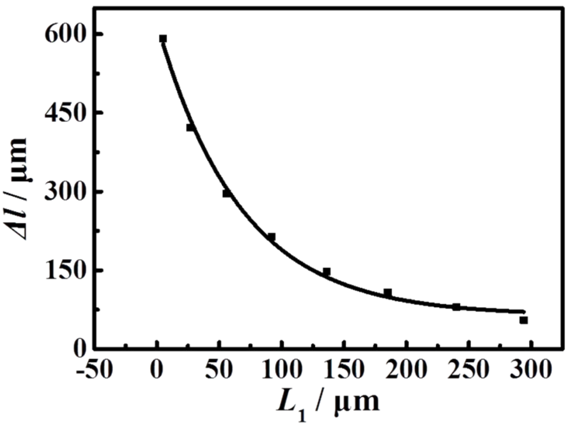

Fig. S6 Changes of the distance between the geometric center and the mass center (Δl) with shell thickness L_1.

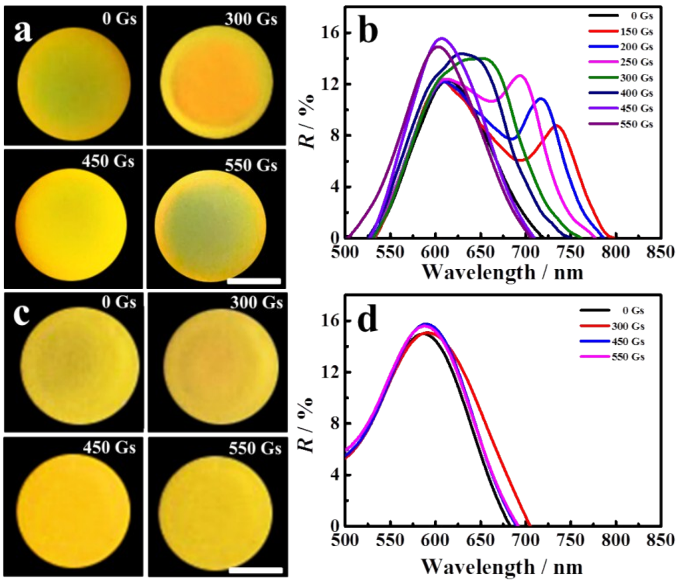

Fig. S7 (a, c) Digital photos and (b, d) reflection spectra of the eccentric 1-D magnetic core-shell PCBs with shell thickness L_1 of (a, b) 56 μm and (c, d) 136 μm under different *H*, of which the direction is parallel to both the magnetic nanochain structures within the PCBs and the observed direction. The scale bars are 1.0 mm.

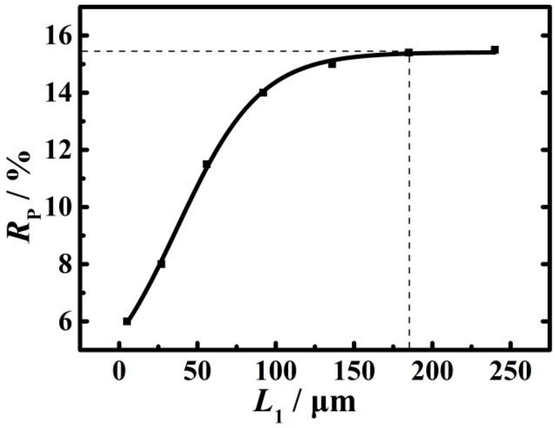

Fig. S8 The relationship between the maximum of diffraction peak (R_p) and shell thickness L_1 for the eccentric 1-D magnetic core-shell PCBs without *H*, where the observed direction is parallel to the magnetic nanochain structures within the PCBs.

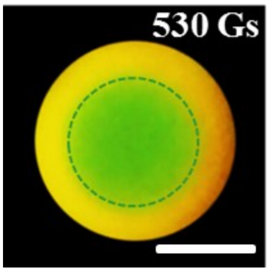

Fig. S9 Digital photo of an eccentric 1-D magnetic core-shell PCB, which are obtained after optimizing the synthetic condition, and under the application of 530 Gs external magnetic field. The scale bar is 1.0 mm.

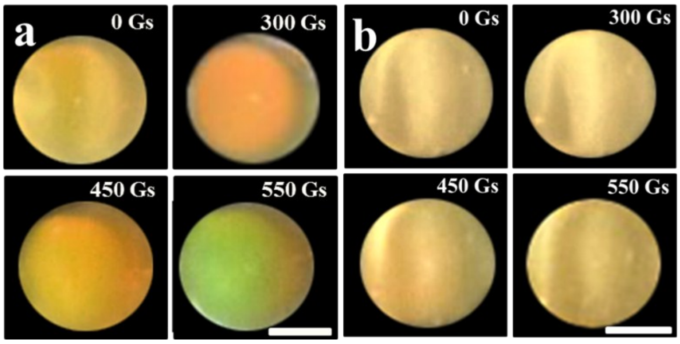

Fig. S10 Digital photos of the eccentric 1-D magnetic core-shell PCBs with L_3 of (a) 140 µm and (b) 300 µm fixed in viscous oil under different *H*, of which the direction is vertical to the 1-D magnetic particle chain-like structures in the PC hydrogel shell and parallel to the observation direction. The scale bars are 1.0 mm.

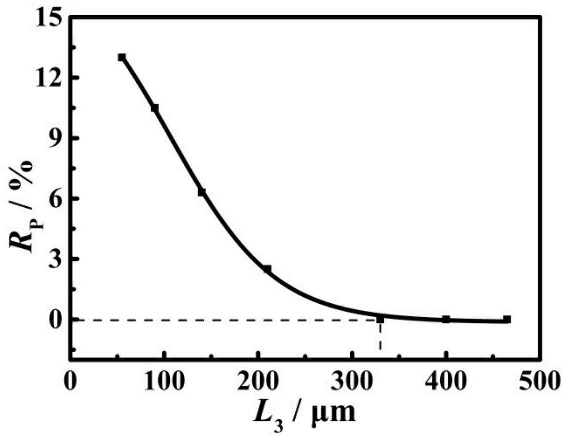

Fig. S11 R_p versus shell thickness L_3 for the eccentric 1-D magnetic core-shell PCBs fixed in viscous oil under H = 450 Gs, of which the direction is vertical to the magnetic nanochain structures within the PCBs and parallel to the observed direction.

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