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

Supporting Information

Photonic nanostructures of nanodiscs with multiple magneto-optical properties

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Supplementary Figures

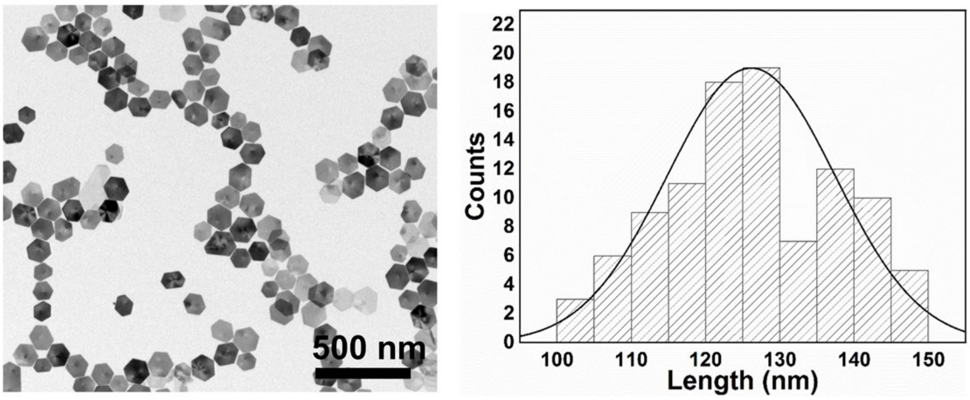

Figure S1. TEM image of $Ni(OH)_2$ nanoplates and their average length (126 nm), obtained by measuring 100 particles.

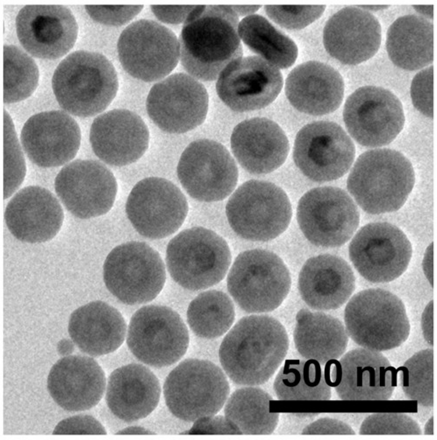

Figure S2. TEM image of $Ni(OH)_2@SiO_2$ nanodiscs obtained by coating a uniform layer of 50 nm-thick silica on the surface of $Ni(OH)_2$ nanoplates.

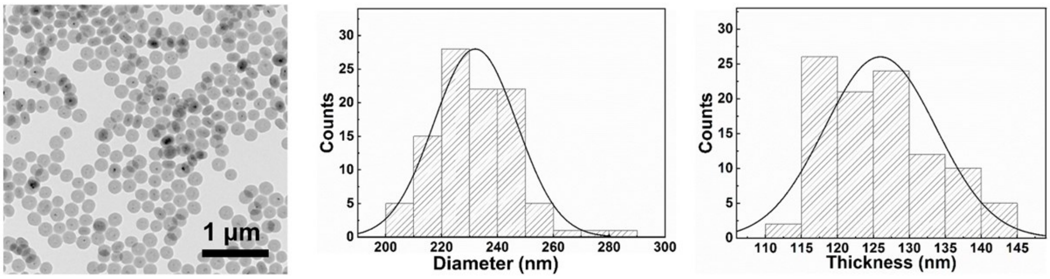

Figure S3. Low-magnification TEM image of Ni@SiO_2-1 nanodiscs and their average diameter (232 nm) and thickness (126 nm).

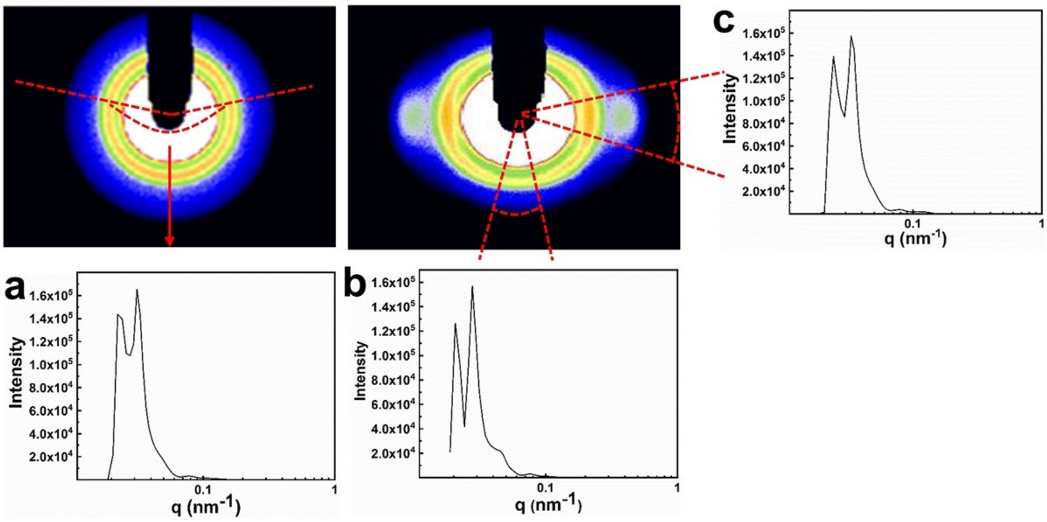

Figure S4. (a) I-q curve of the SAXS pattern in the absence of magnetic field. The intensity was integrated in any diffraction regions. I-q curve of the SAXS pattern with the magnetic field along the (b) vertical and (c) horizontal direction. The intensity along those directions were integrated in a thirty degree of sector from the center.

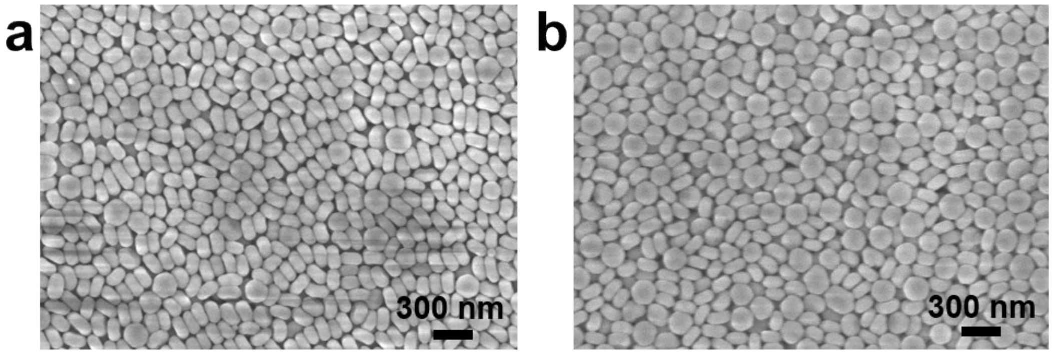

Figure S5. SEM image of assembled Ni@SiO_2 nanodiscs (a) under a vertical and (b) horizontal magnetic field.

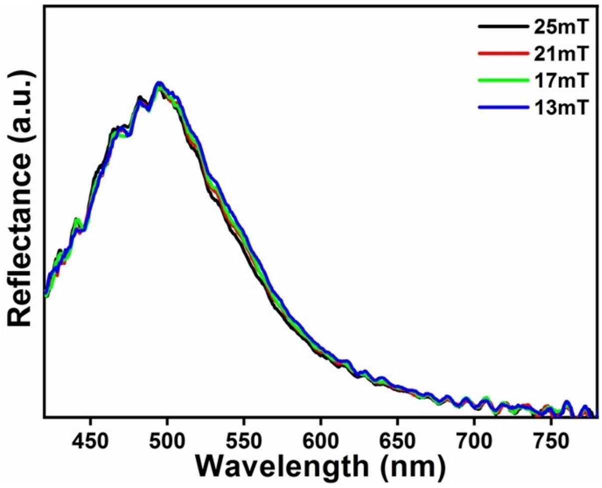

Figure S6. Reflection spectra of the 22% Ni@SiO_2-1 sample in the presence of magnetic fields with different strengths (θ was kept at 90°).

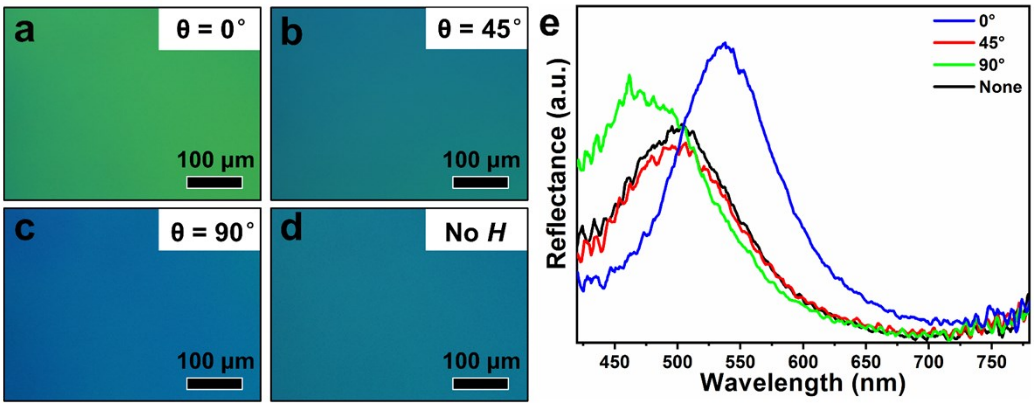

Figure S7. (a-d) Optical microscopy images showing the magnetic tuning of structural color of the 49% Ni@SiO_2-1. (e) Reflection spectra of the 49% Ni@SiO_2-1 in response to magnetic fields with different directions. The corresponding strengths of the magnetic field applied from 0°, 45° and 90° are 175, 75 and 80 mT, respectively.

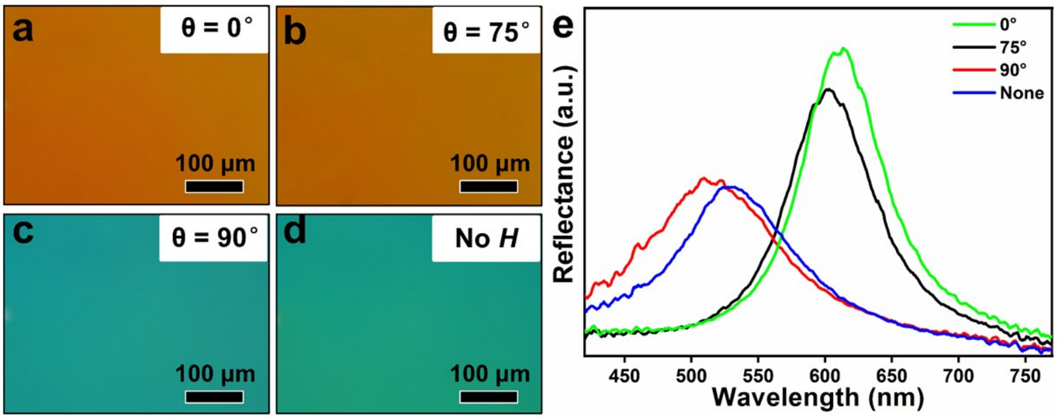

Figure S8. (a-d) Optical microscopy images showing the magnetic tuning of structural color of the 30% Ni@SiO_2-1. (e) Reflection spectra of the 30% Ni@SiO_2-1 in response to magnetic fields with different directions. The corresponding strengths of the magnetic field applied from 0°, 75° and 90° are 175, 75 and 80 mT, respectively.

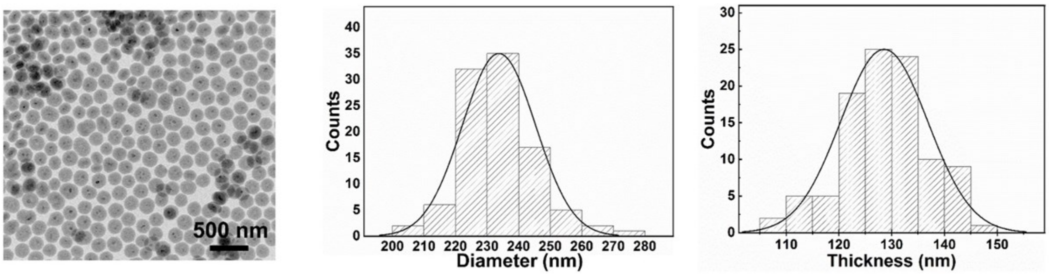

Figure S9. Low-magnification TEM image of Ni@SiO_2-2 nanodiscs with different aspect ratio and their average diameter (236 nm) and thickness (132 nm).

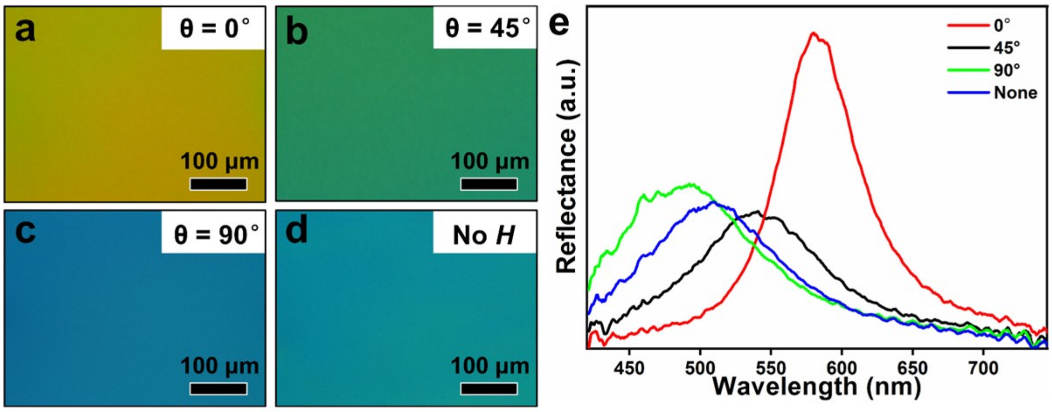

Figure S10. (a-d) Optical microscopy images showing magnetic tuning of structural color of 49% Ni@SiO_2-2. (e) Reflection spectra of the 49% Ni@SiO_2-2 in response to magnetic fields with different directions. The corresponding strengths of the magnetic field applied from 0°, 45° and 90° are 175, 75 and 80 mT, respectively.

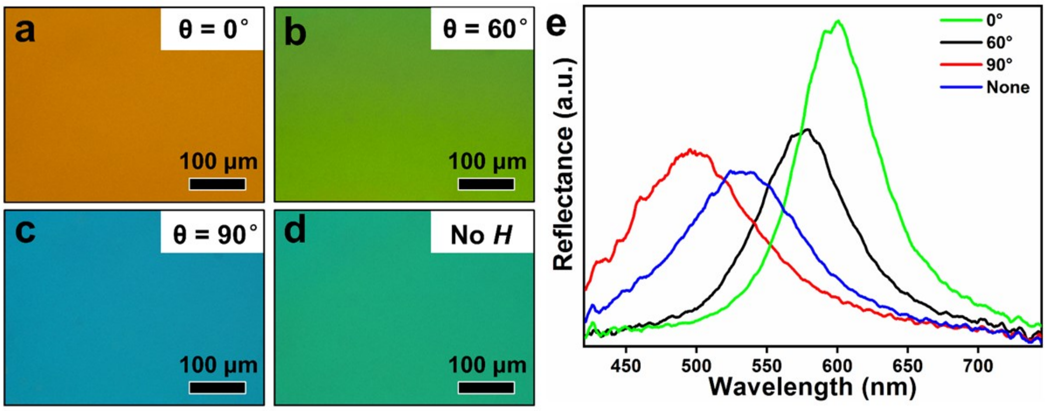

Figure S11. (a-d) Optical microscopy images showing magnetic tuning of structural color of 30% Ni@SiO_2-2. (e) Reflection spectra of the 30% Ni@SiO_2-2 in response to magnetic fields with different directions. The corresponding strengths of the magnetic field applied from 0°, 60° and 90° are 175, 76 and 80 mT, respectively.

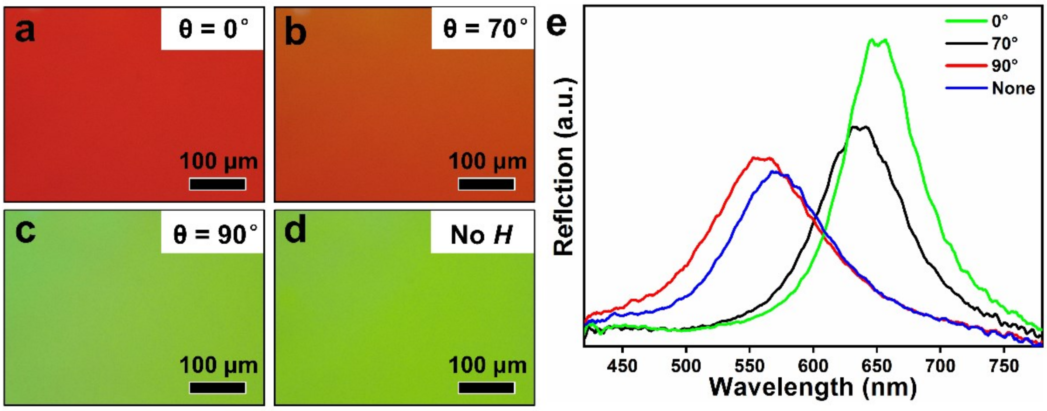

Figure S12. (a-d) Optical microscopy images showing magnetic tuning of structural color of 22% Ni@SiO_2-2. (e) Reflection spectra of the 22% Ni@SiO_2-2 in response to magnetic fields with different directions. The corresponding strengths of the magnetic field applied from 0°, 70° and 90° are 175, 80 and 80 mT, respectively.

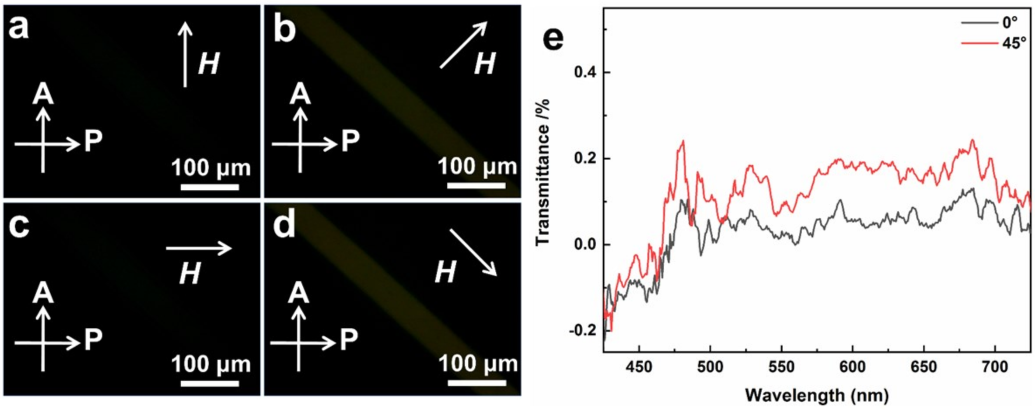

Figure S13. (a-d) POM images showing the magnetic tuning of transmittance of the 49% sample sealed in a microfluidic channel. (e) Transmittance spectra of the sample under different magnetic fields.