Supplementary information

Magnetically driven hierarchically ordered carbonyl iron@SiO_2/Ni@Ag/silicone rubber composite film for enhanced electromagnetic interference shielding with ultralow reflection

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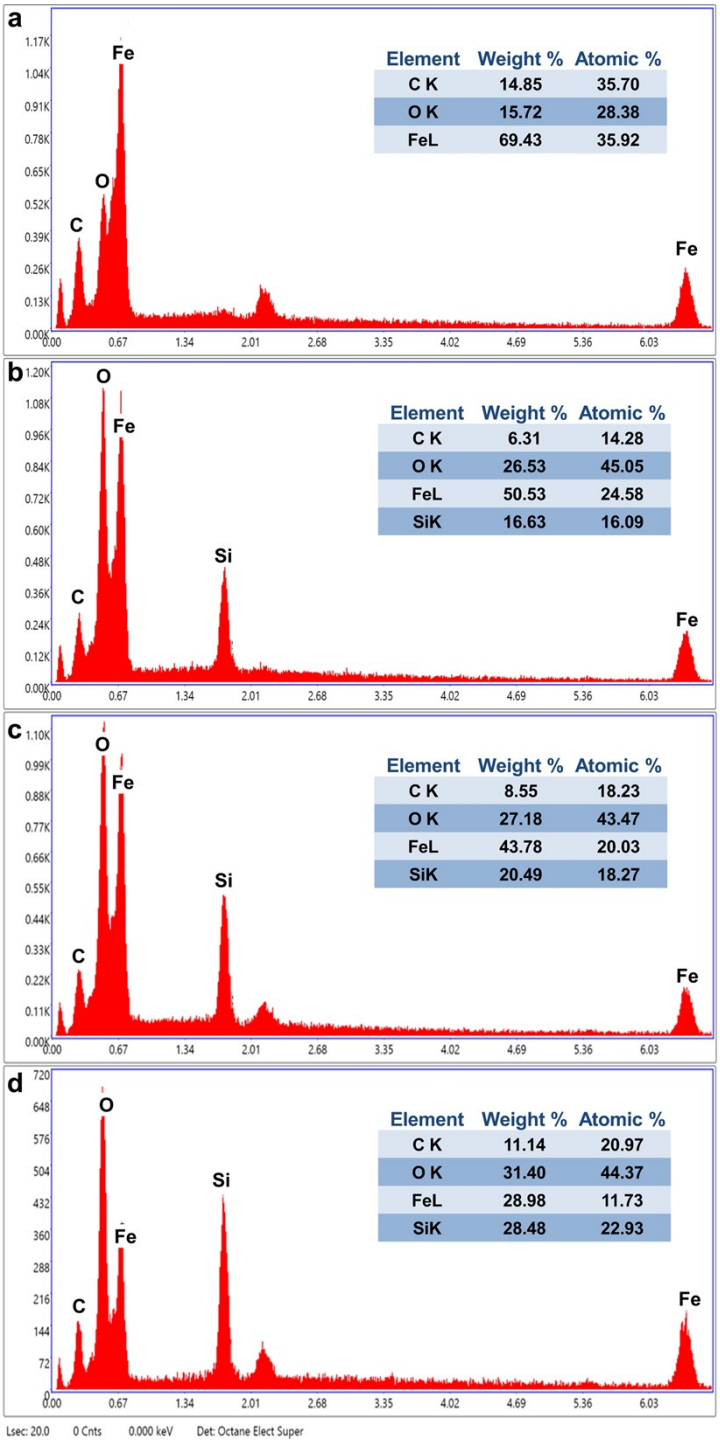

Fig. S1 EDS and the elemental contents of (a) CI, (b) CS-2, (c) CS-3, and (d) CS-5.

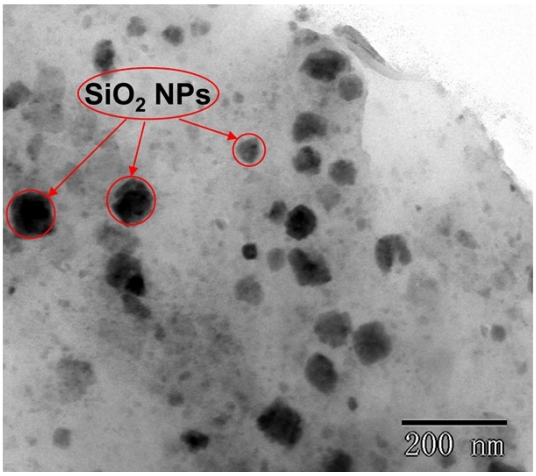

Fig. S2 TEM image of the CS-3 microparticles.

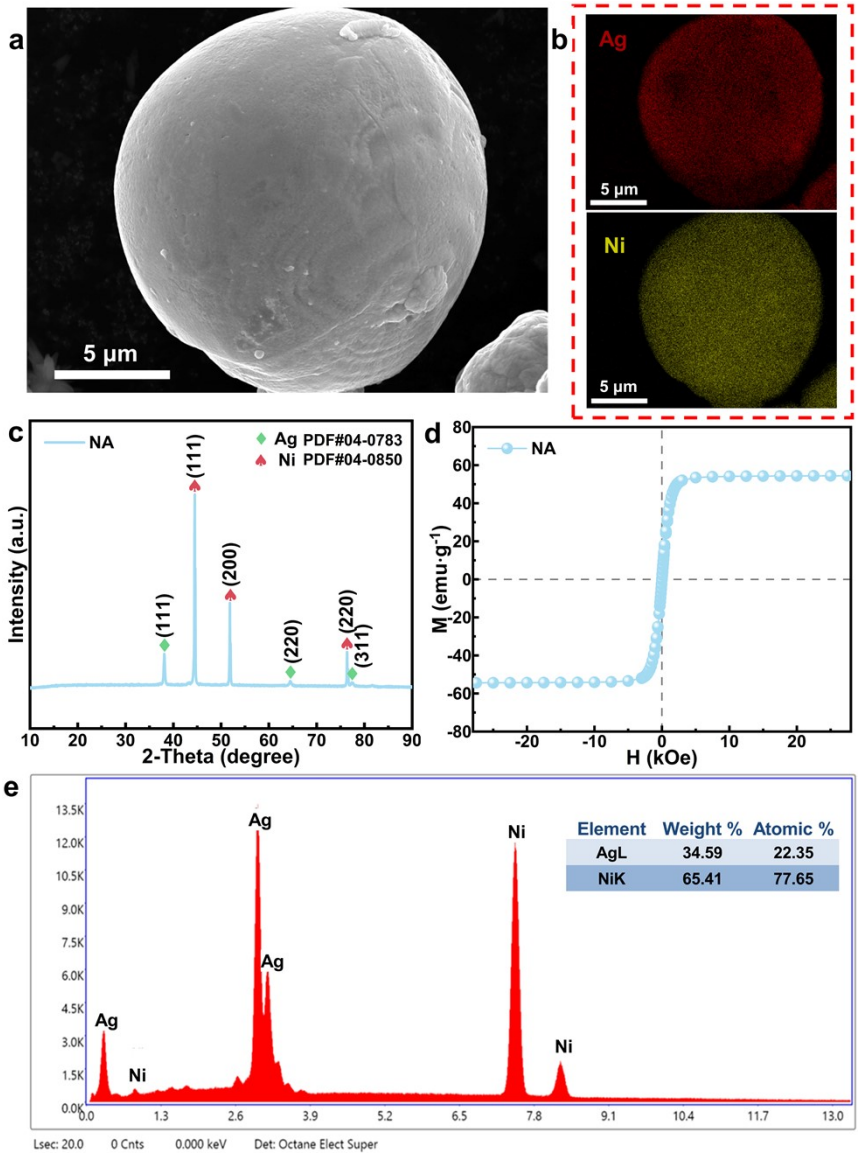

Fig. S3 (a) SEM, (b) EDS, (c) XRD, (d)VSM, and (e) EDS of NA microparticles.

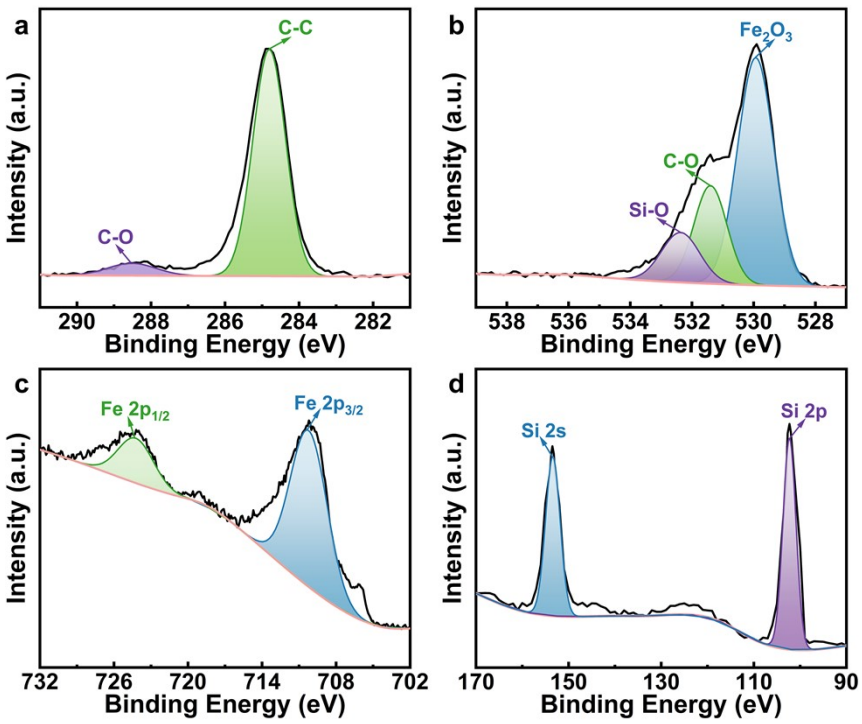

Fig. S4 High-resolution XPS spectra of (a) C 1s, (b) O 1s, (c) Fe 2p, and (d) Si of CS-3 microparticles.

Table S1. The chemical bond percentage calculated from the high-resolution XPS deconvolution results of CS-3 microparticles.

Spectra	Chemical bonds	Percentage (%)
C 1s	C-C	88.4
	C-O	11.6
O 1s	Fe_2O_3	61.6
	C-O	24.2
	Si-O	14.2
Si	Si 2p	54.2
	Si 2s	45.8
Fe 2p	$Fe\ 2p_{1/2}$	21.7
	$Fe\ 2p_{3/2}$	78.3

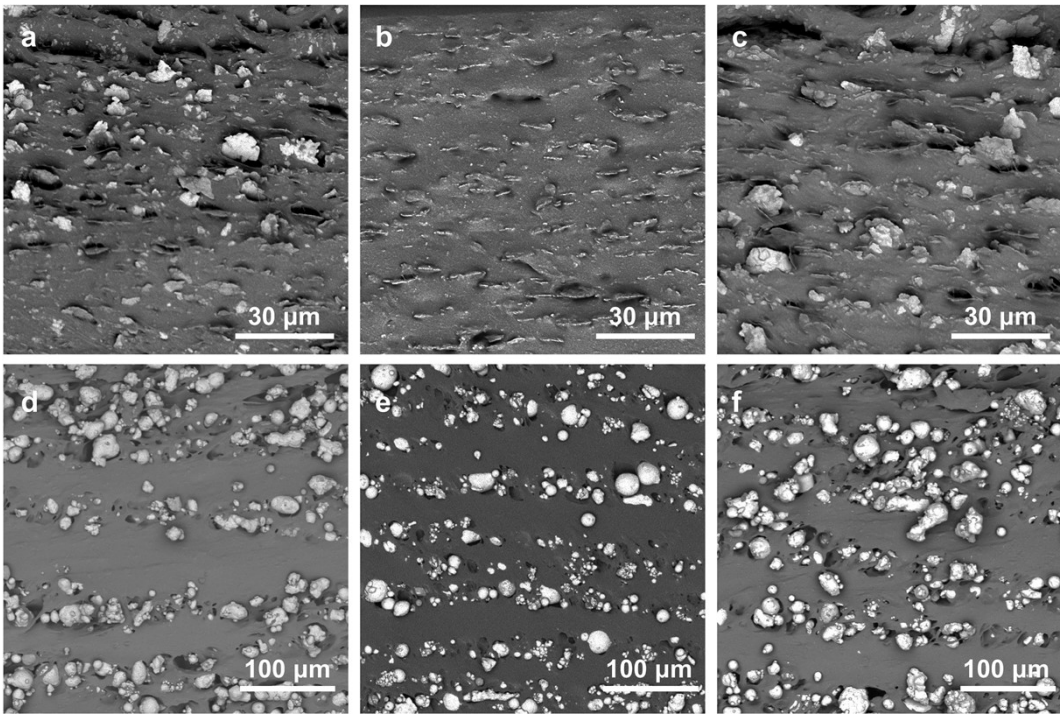

Fig. S5 SEM images of the CS layer (a-c) and NA layer (d-f) aligned under various magnetic field intensities and rotating platform speeds: (a) intensity = 250 mT, speed = 2.0 Hz; (b) intensity = 250 mT, speed = 2.5 Hz; (c) intensity = 200 mT, speed = 2.5 Hz; (d) intensity = 250 mT, speed = 1.25 Hz; (d) intensity = 250 mT, speed = 0.75 Hz, and (d) intensity = 200 mT, speed = 0.75 Hz.

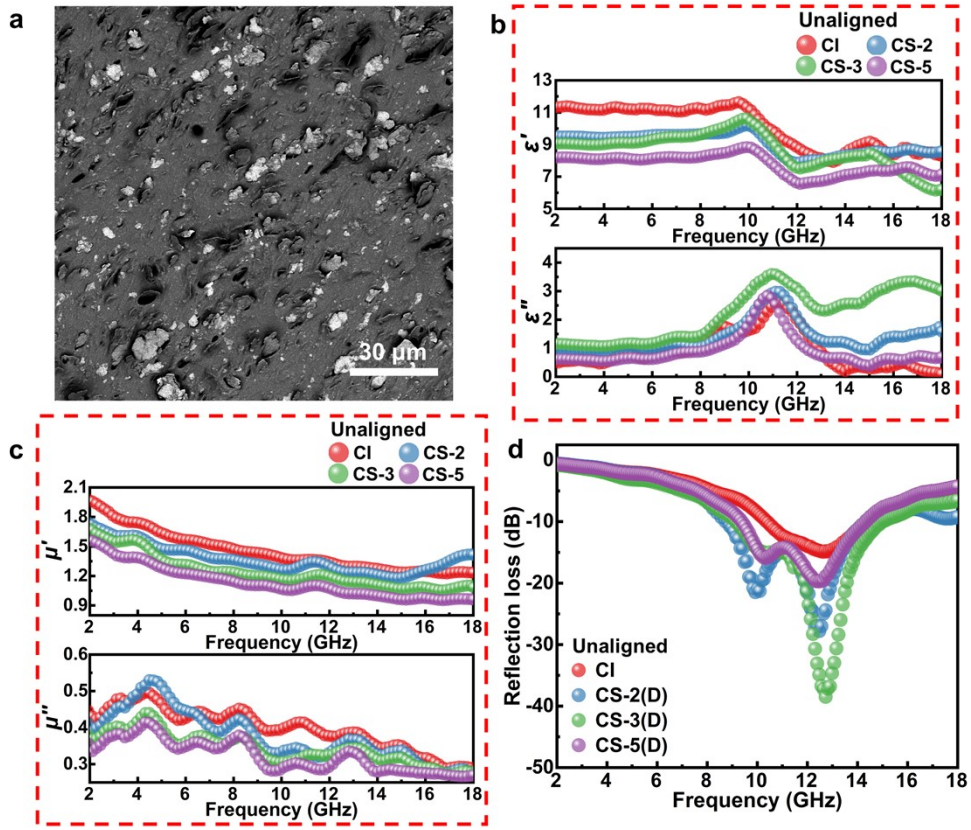

Fig. S6 (a) Cross-sectional SEM image of the unaligned CS layer, (b-c) EM parameters (ε', ε'', μ', μ'') and (d) RL curves of the unaligned CI and CS samples.

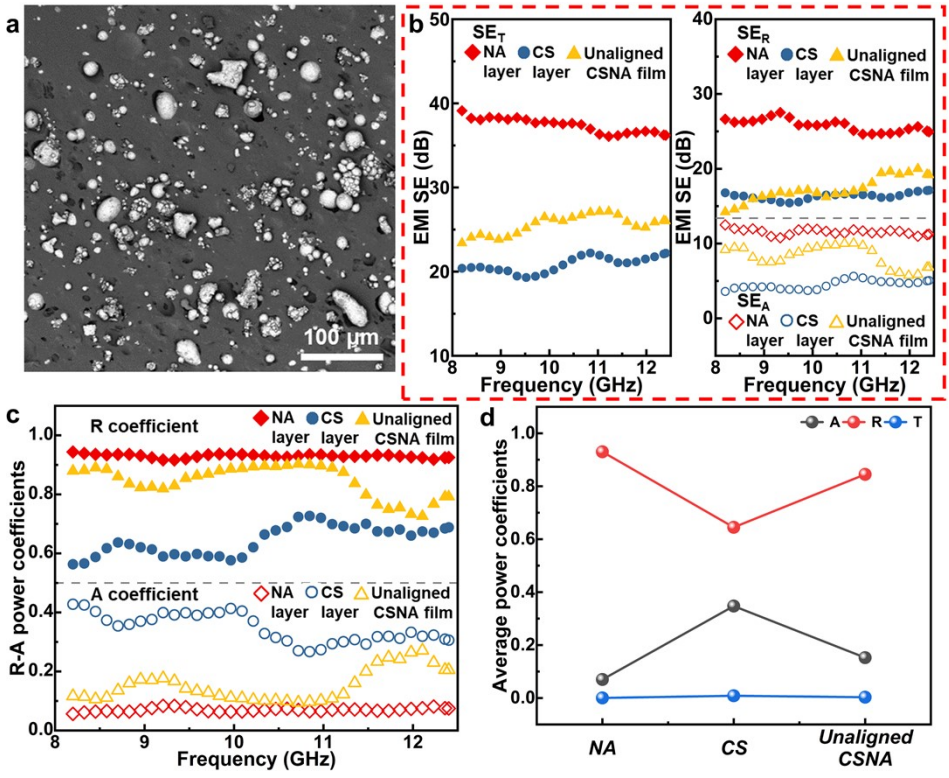

Fig. S7 (a) Cross-sectional SEM image of the unaligned NA layer, (b) SE_T, SE_R and SE_A, (c) R, A, and (d) average power coefficients of CS layer, NA layer, and

unaligned CSNA film.

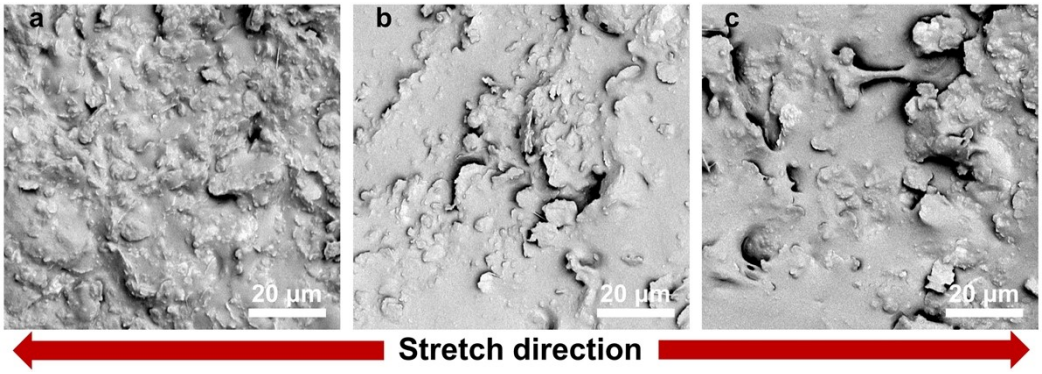

Fig. S8 (a) SEM images of CS layer of the CSNA composite film at different strains of (a) 0 %, (b) 50 %, and (c) 100%.