Optimizing Electromagnetic Wave Absorption in Electrospun Carbon-based Fibers through Dielectric and Magnetic Component Modulation

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▽Yuchao Wang and Yunlong Liu contributed equally to this work.

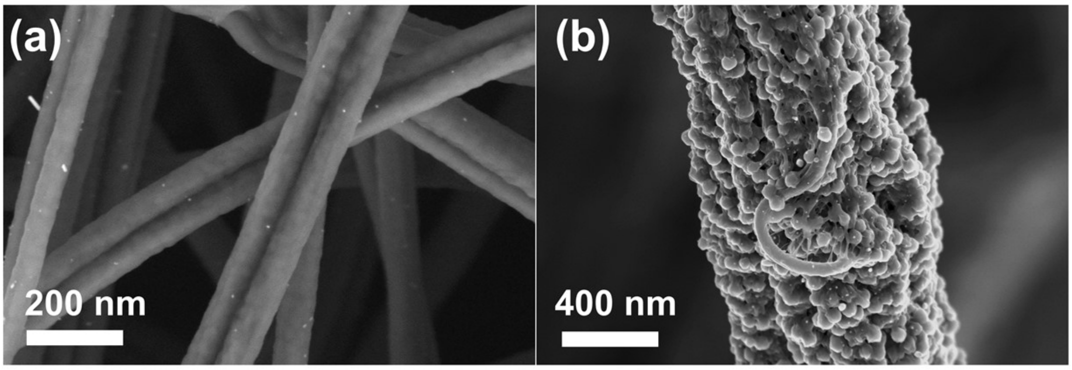

Figure S1. SEM images of (a) Carbon nanofibers and (b) CNTs embedded in composite carbon nanofibers.

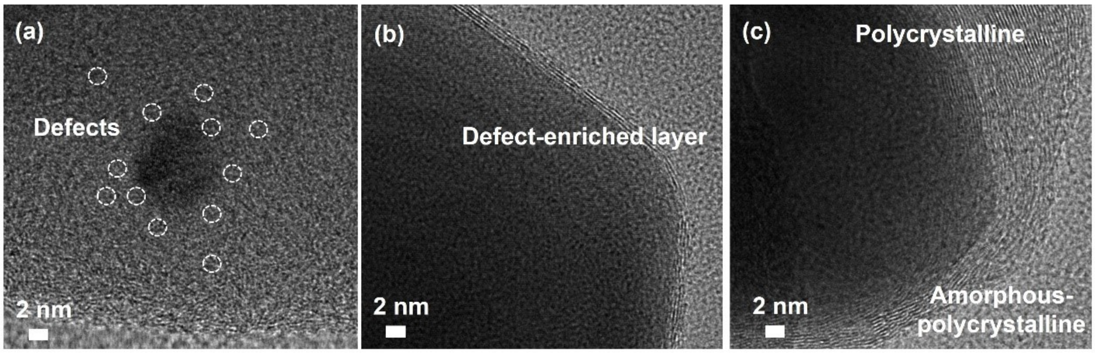

Figure S2. (a-b) HRTEM image of Ni-CNT/CNFs(7).

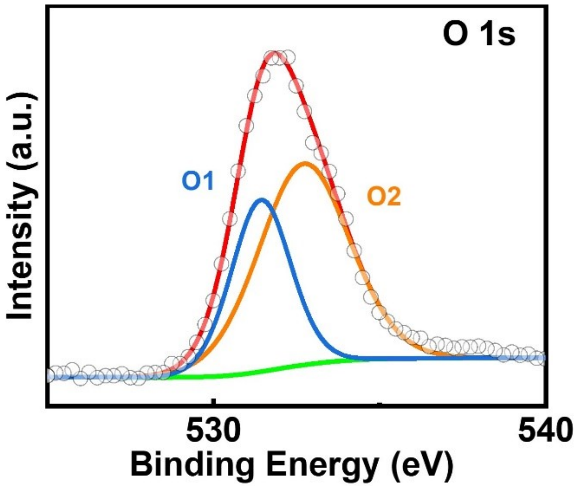

Figure S3. O 1s XPS spectra of Ni-CNT/CNFs(7).

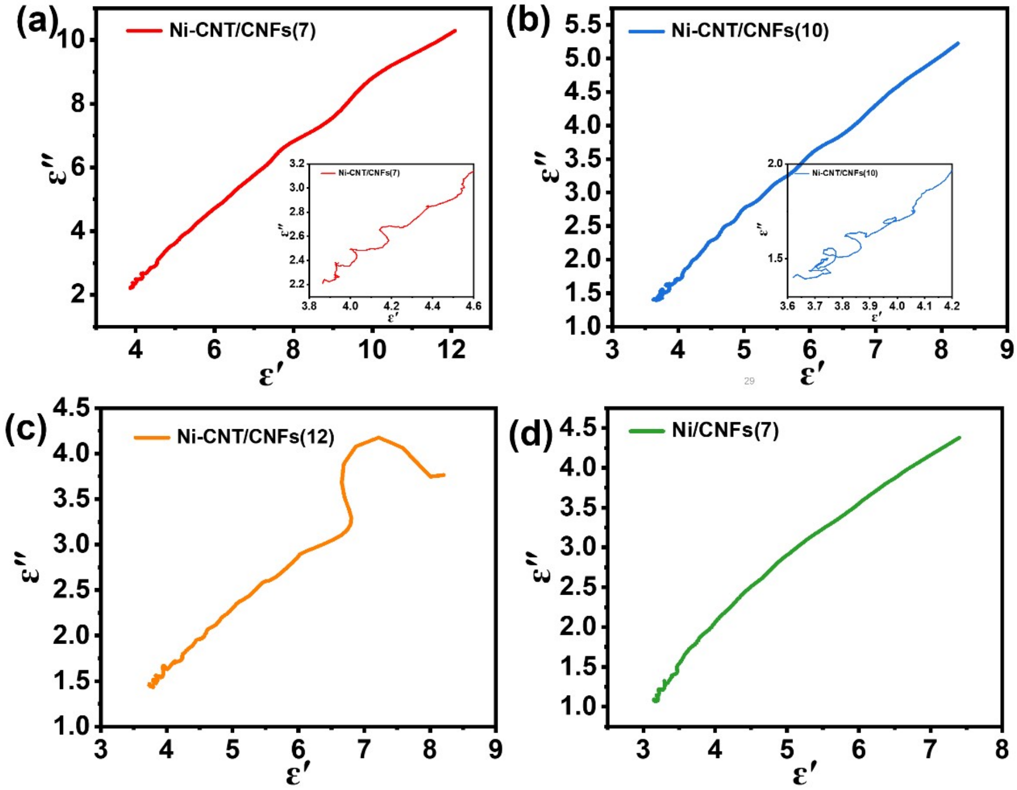

Figure S4. Cole–Cole graphs of (a) Ni-CNT/CNFs(7) , (b) Ni-CNT/CNFs(10), (c) Ni-CNT/CNFs(12) and (d) Ni /CNFs(7).

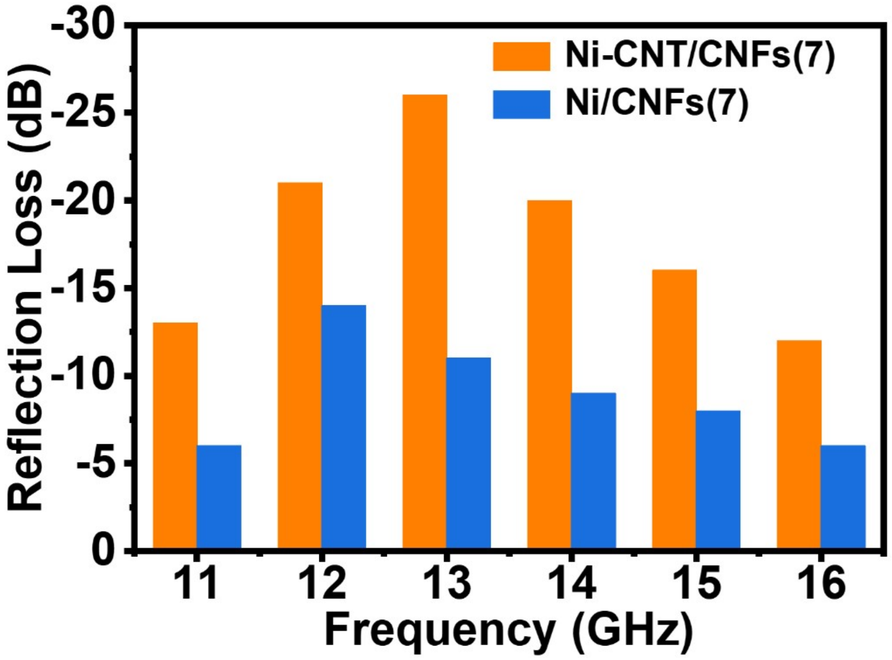

Figure S5. Comparisons of RL value of Ni/CNFs(7) compared to Ni-CNT/CNFs(7) at the same thicknesses.

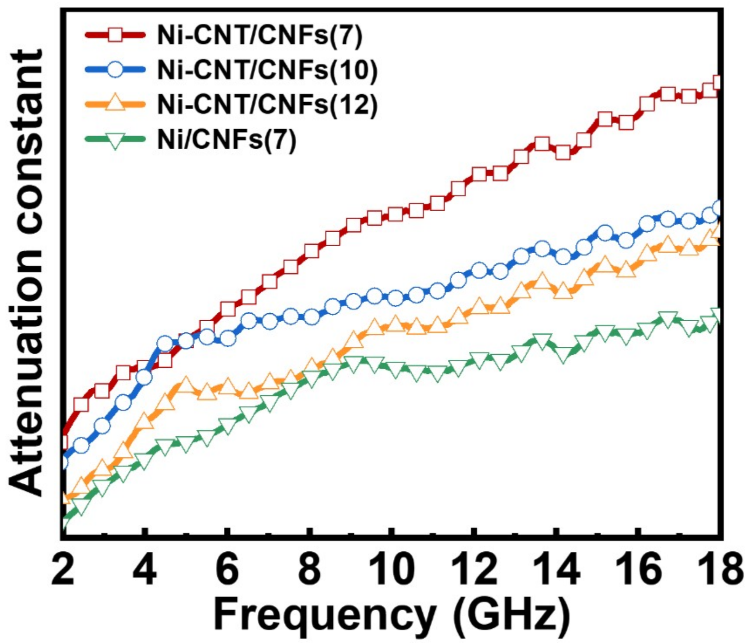

Figure S6. Attenuation constant diagram of the sample.

Table S1. Comparison of EMW absorption properties of carbon nanofibers prepared by electrospinning

Samples	Filling Raotio （wt%）	Minimum RL at low frequency			Ref
		RL_{min} (dB)	Matching thickness (mm)	Matching frequency (GHz)	
Ni/MnO-CNFs	15	-53.23	2.30	6.50	[1]
$Fe_{0.64}Ni_{0.36}$@CNFs	50	-34.21	4.00	5.00	[2]
Fe_2O_3/ CNFs	20	-38.10	2.30	4.20	[3]
Fe/Co-CNFs	50	-38.10	2.50	4.10	[4]
Co-Fe@C/SiO2NFs	30	-59.60	1.43	4.60	[5]
C_f@FeS_2	20	-54.11	1.98	6.04	[6]
CF@PPy@CoFe2O4	20	-55.33	2.42	6.48	[7]
Ni-CNT/CNFs(7)	15	-69.20	2.90	7.30	This work

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Corrosion Resistance Test

In our study, we used the CHI760E electrochemical workstation (Shanghai Chenhua Instrument Co., Ltd.) to measure the polarization kinetic potential curve and electrochemical impedance spectroscopy (EIS) of the materials, in order to evaluate the samples' antioxidation and corrosion resistance. The specific experimental conditions are as follows:

Using a three-electrode setup, we examined the electrochemical characteristics of every sample. Each of the compounds was employed straight as a working electrode, whereas Ag/AgCl and Pt served as reference and counter electrodes, respectively. All tests were conducted using a 3.5 wt% NaCl electrolyte solution. All experiments occurred under ambient conditions.