

N-doped carbon layer clad carbon sphere for broadband and boosted microwave attenuation capacity

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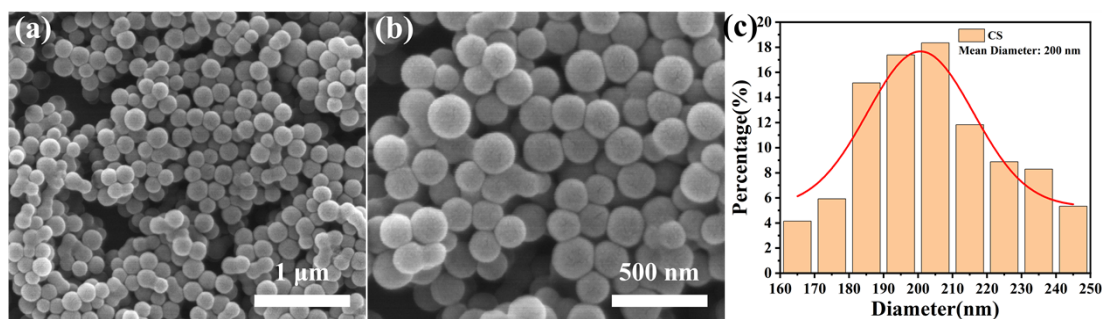


Fig. S1. (a,b) SEM images of CSs and (c) diameter statistics image.

Table S1. The proportion of carbon and nitrogen element in the C@NC nanospheres.

Element	C		N	
	Weight %	Atomic %	Weight %	Atomic %
C@NC-1	87.15	88.78	12.85	11.22
C@NC-2	84.21	86.15	15.79	13.85
C@NC-3	71.99	74.98	28.01	25.02

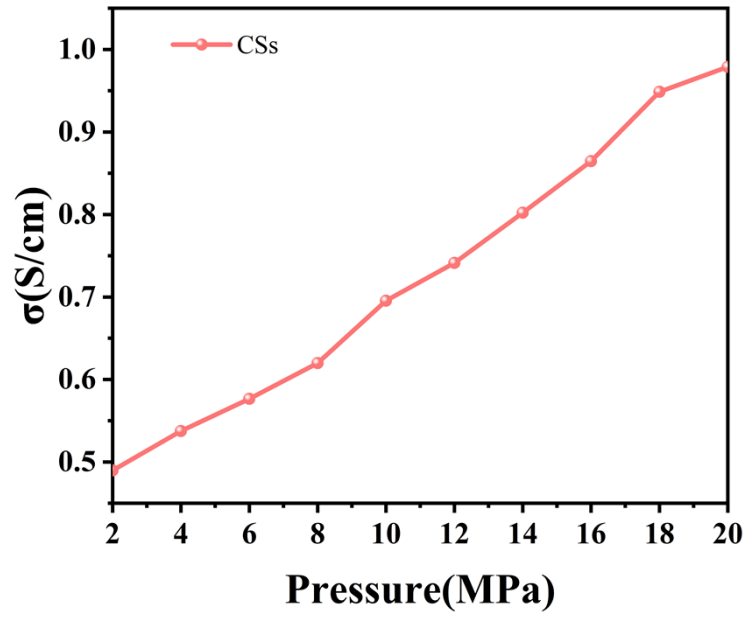


Fig. S2. The powder conductivity of pyrolytic CSs under different pressure.

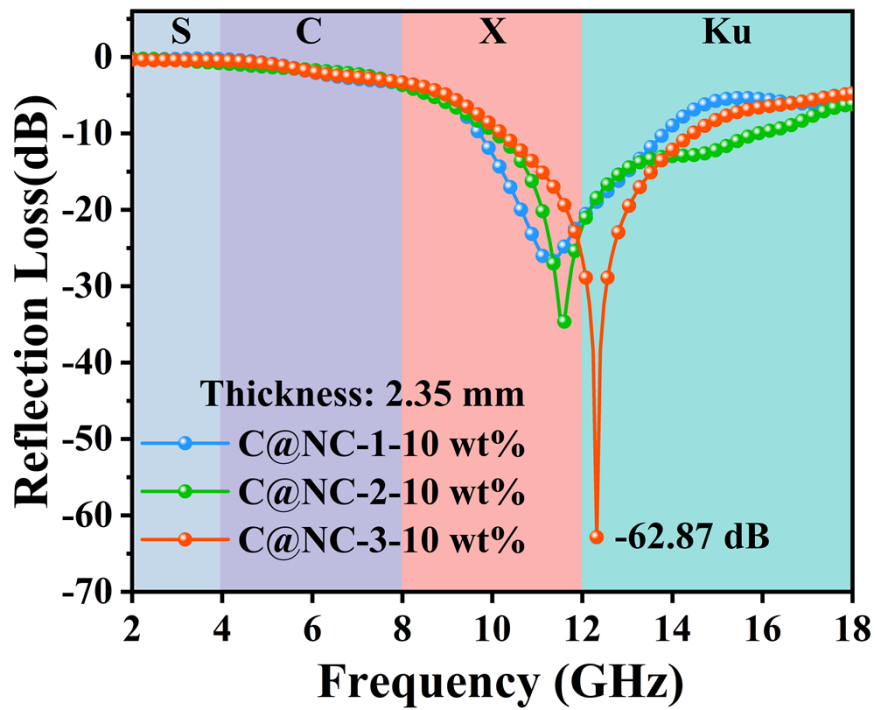


Fig. S3. The RL pattern of C@NC/PVDF composites with a filler loading of 10 wt% at 2.35 mm.

Table S2. Comparison of EMW absorption properties with other publications

Sample	Matrix	Filling amount (wt%)	RL _{min} (dB)	Thickness (mm)	EAB (GHz)	Thickness (mm)
CS	paraffin	25.0	-37.20	2.00	5.75	2.00
wrinkled carbon microspheres	paraffin	50	-49.45	1.90	4.75	1.90
MWCNTs/rGO/PPy	paraffin	30	-57.00	2.10	4.60	2.10
hollow bowl-like carbon	paraffin	4	-50.00	2.26	7.04	2.00
hollow carbon cubes	paraffin	5	-50.50	2.70	6.20	2.70
Yolk-shell C@C	paraffin	50.0	-34.80	1.85	5.40	2.00
nanodiamond@hollow carbon sphere	paraffin	5	-47.1	2.15	3.40	2.15
C@void@C	paraffin	50.0	-27.50	2.96	4.90	2.00
graphite@silicon carbide	Rubber	73.7	-31.90	2.00	2.90	2.00
carbon@polyaniline microspheres	paraffin	30.0	-59.60	2.20	5.40	2.20
prism-shaped hollow carbon@ polyaniline	paraffin	30	-64.00	2.50	5.00	2.50
C@NC-2	PVDF	10.0	-51.89	1.68	6.29	2.01
C@NC-3	PVDF	10.0	-62.87	2.35	4.62	1.96

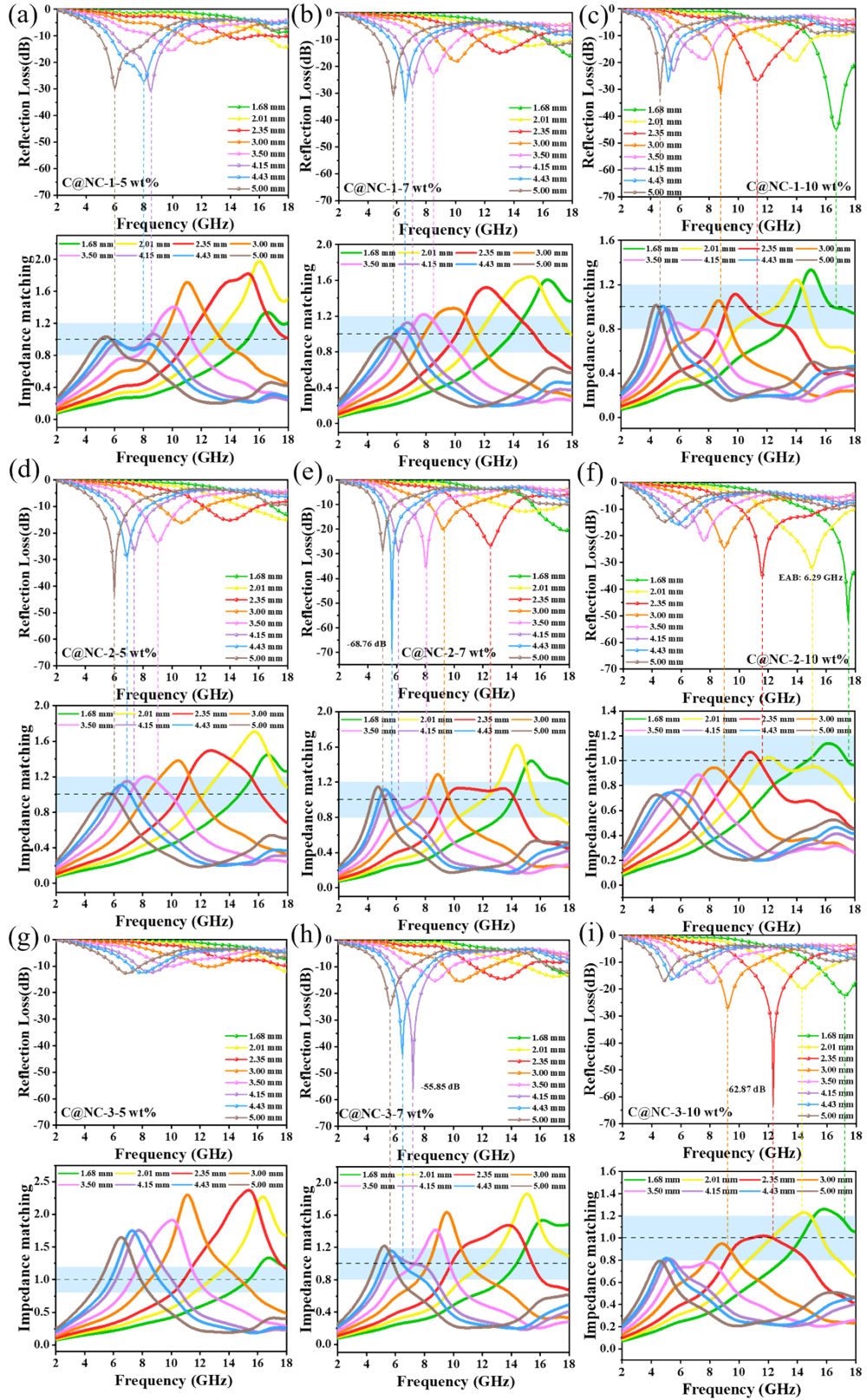


Fig. S4. RL curves and corresponding impedance matching characteristics of (a-c) C@NC-1/PVDF, (d-e) C@NC-2/PVDF and (g-i) C@NC-3/PVDF composites with different filler loadings.