

Supplementary Information for

A Novel Hierarchically Lightweight Porous Carbon Derived from Egg White for Strong Microwave Absorption

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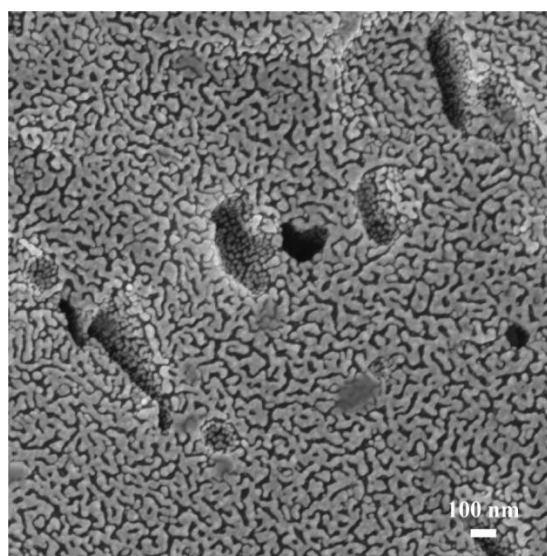


Fig. S1. Morphology of “grooved skeleton” in the porous carbon (taken from NPC3-600).

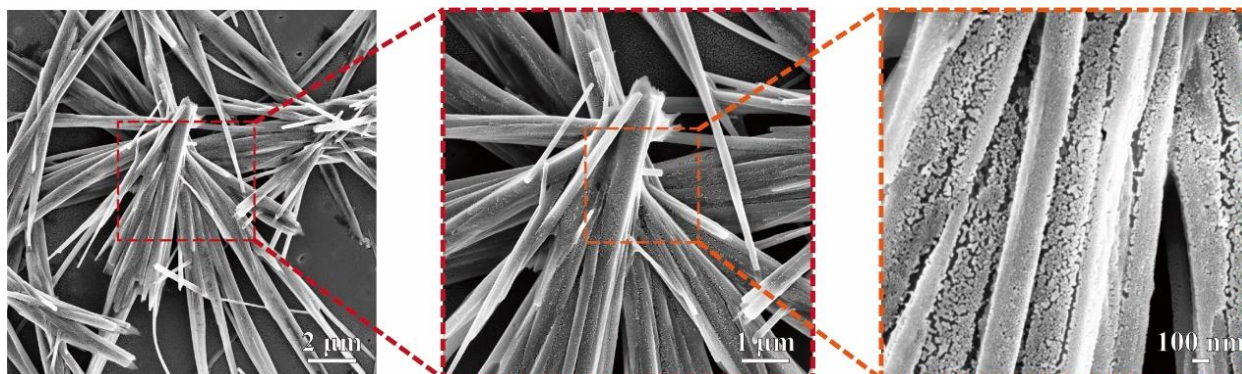


Fig. S2. Morphology of “fibrous clusters” in the porous carbon (taken from NPC3-700).



Fig. S3. SEM images of NPCs with typical morphology of “fibrous cluster-grooved skeleton” (taken from NPC3-600).

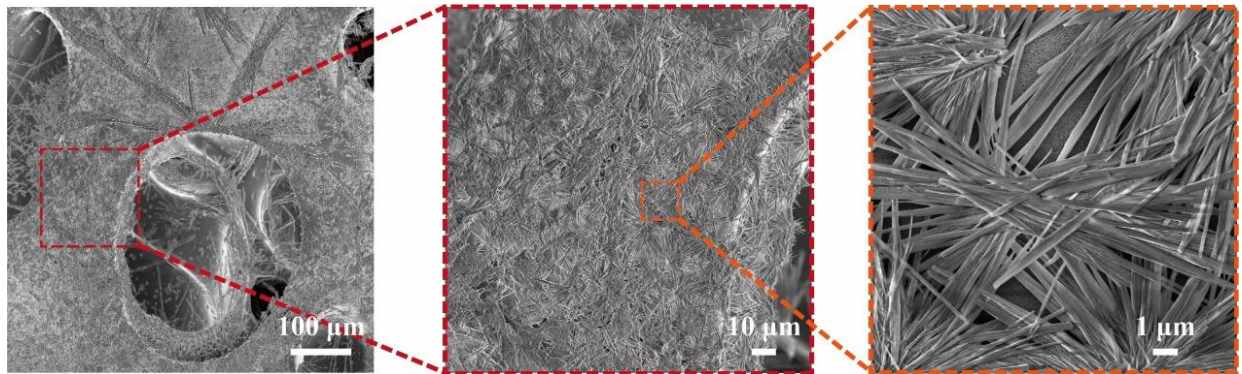


Fig. S4. SEM images of NPCs with typical morphology of “fibrous cluster-grooved skeleton” (taken from NPC0-700).

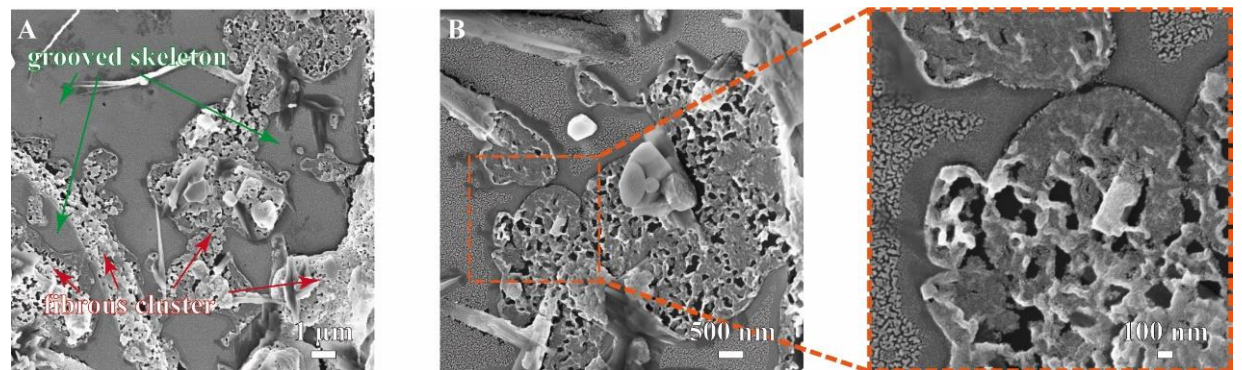


Fig. S5. Cross-sectional SEM images of NPCs with typical morphology of “fibrous cluster-grooved skeleton” (taken from NPC3-700).

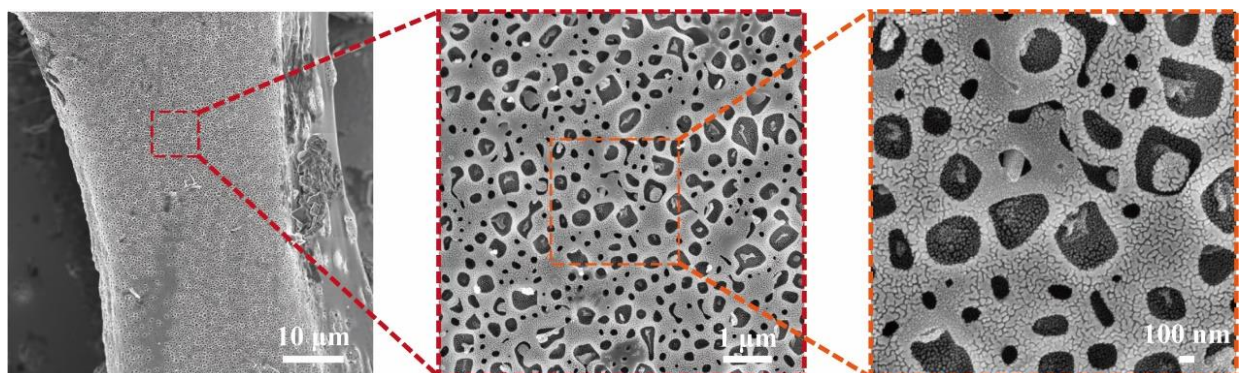


Fig. S6. Morphology of “honeycomb holes” in the porous carbon (taken from PNPC5-700).

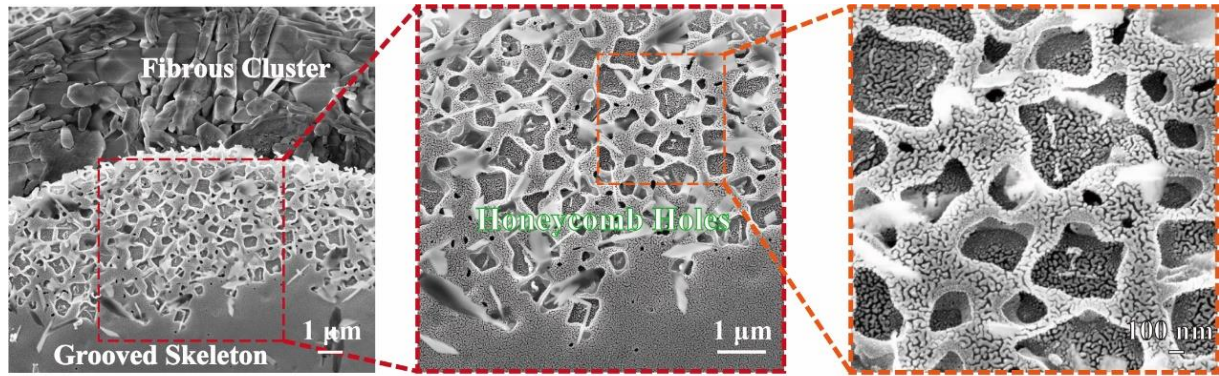


Fig. S7. Cross-sectional SEM images of PNPCs with typical morphology of “fibrous clusters-honeycomb holes-grooved skeleton” (taken from PNPC10-700).

Table S1

The performance of biomass-derived microwave absorbing materials.

Sample	Reflection loss		RL \leq -10 dB				Ref.
	-RL _{max} (f_c) [dB (GHz)]	d_m (mm)	Matrix-filler content (wt%)	Effective bandwidth (GHz)	d_m (mm)	Matrix-filler content (wt%)	
Co@C@NPC (wheat flour)	57.2 (9.6)	3	Paraffin wax-10	5.7 (7.5–13.2)	3	Paraffin wax-10	[1]
Fe ₃ S ₄ @C (wax gourd)	58.85 (~8)	3.1	Paraffin-20	5.4 (~11.9–17.3)	2	Paraffin-20	[2]
CoFe ₂ O ₄ /C/PANI (grapefruit peel)	51.81 (12.4)	2.57	Paraffin-25	8.88 (~9.12–18)	2.5	Paraffin-25	[3]
K ₂ CO ₃ -PC (pinecone)	76 (12)	2.1	Paraffin-20	5.92 (11.92–17.84)	2.3	Paraffin-20	[4]
HPMC (rice)	52	1.7	Paraffin-15	5	1.65	Paraffin-15	[5]
Co@Co ₃ O ₄ /C (fish scale)	89.3 (~11.7)	2.4	Paraffin-20	6.08 (11.92–18)	2	Paraffin-20	[6]
CF/rGO/Fe ₃ O ₄ @CNW (cotton)	63 (5.4)	2.05	Wax-20	5.8 (~12.2–18)	1.95	Wax-20	[7]
HCF@CZ-CNTs (cotton)	53.5 (7.8)	2.9	Paraffin-10	8.02 (9.98–18)	2	Paraffin-10	[8]
C@CoFe ₂ O ₄ (eggshell membrane)	49.6 (9.2)	2.5	Paraffin-30	—	—	—	[9]
EWC (egg white)	47.09 (13.8)	1	Paraffin-40	2.8	1.4	Paraffin-40	[10]
Fe ₃ O ₄ /HPC (egg white)	57.8 (7.36)	3.48	Wax-40	6 (11.92–17.92)	2.03	Wax-40	[11]
Fe ₃ O ₄ @AEWC (egg white)	43.7 (9.92)	2.5	Paraffin wax-20	13.6 (4.4–18)	2.5	Paraffin wax-20	[12]
Egg white (PNPC10)	66.15 (8.86)	3.77	Paraffin-15	5.09 (12.18–18)	2.5	Paraffin-15	This work

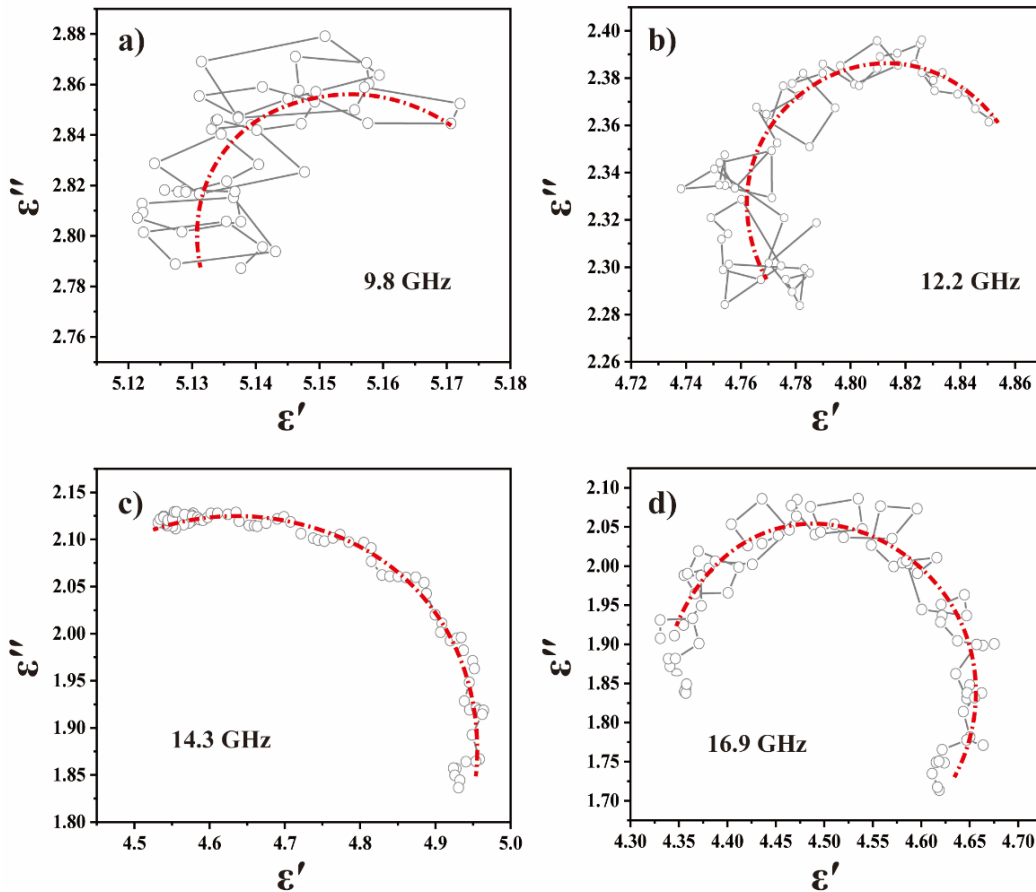


Fig. S8. Cole–Cole semicircle plots of the PNPC10-700 at multiple Debye relaxation frequencies.

References

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