

Supporting Information

Natural iron embedded hierarchically porous carbon with thin-thickness and high-efficiency microwave absorption properties

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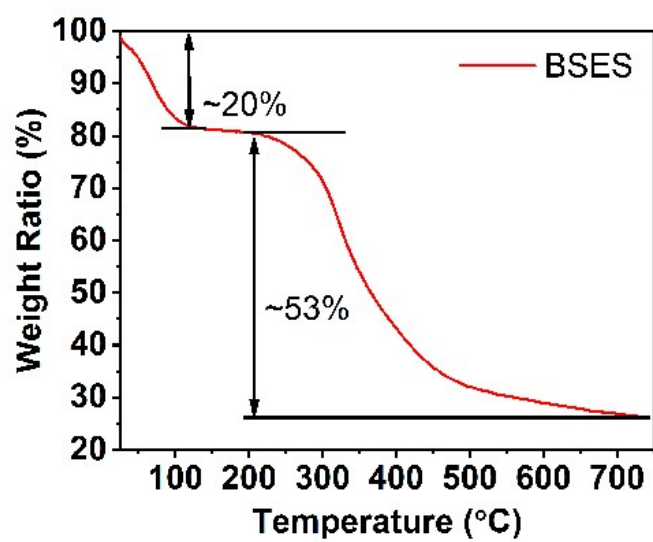


Fig. S1 TG curve of raw BSES.

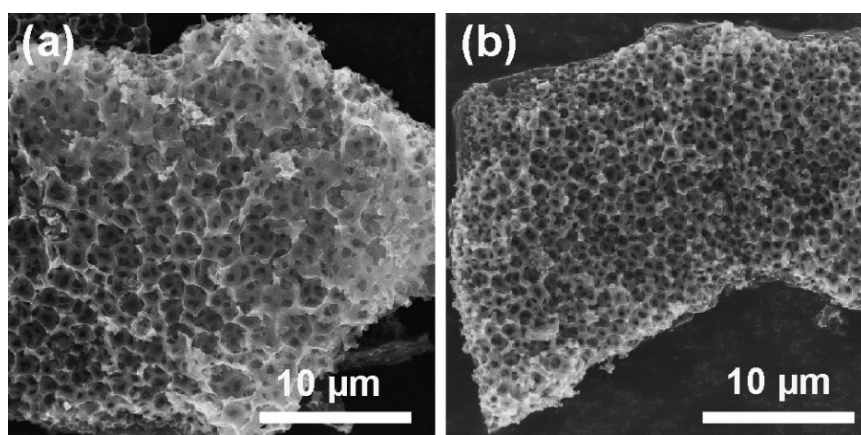


Fig. S2 FESEM images of (a) HPC-0.5, and (b) HPC-2.

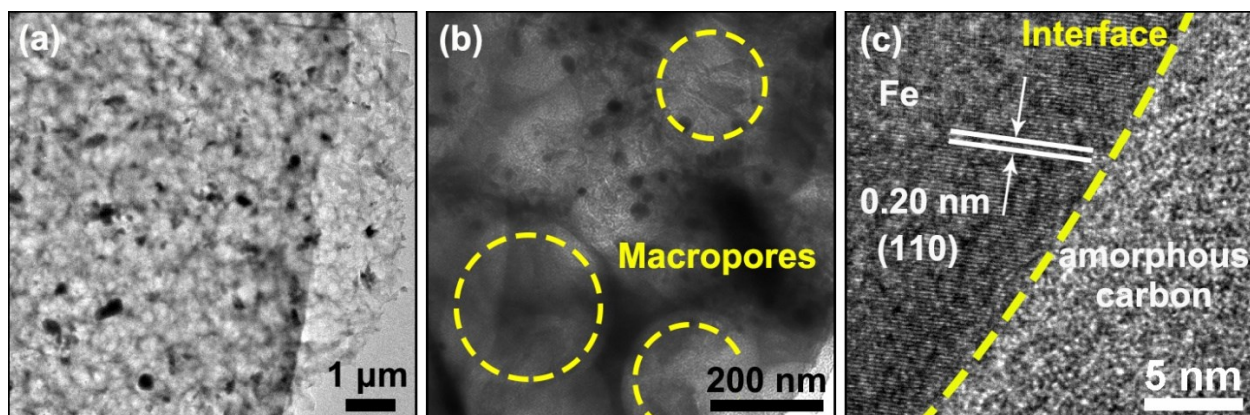


Fig. S3. (a) Low-magnification, (b) high-magnification TEM images, and (c) HRTEM image of HPC-1.

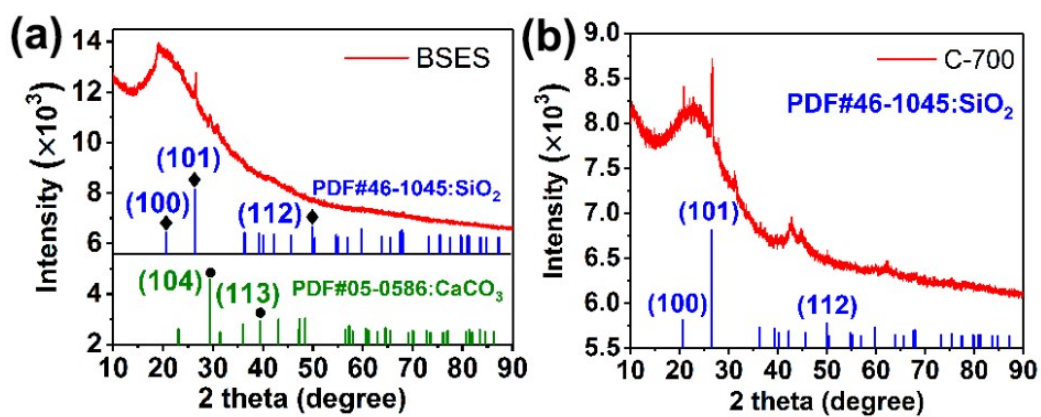


Fig. S4 XRD patterns of (a) raw BSES, and (b) C-700, respectively.

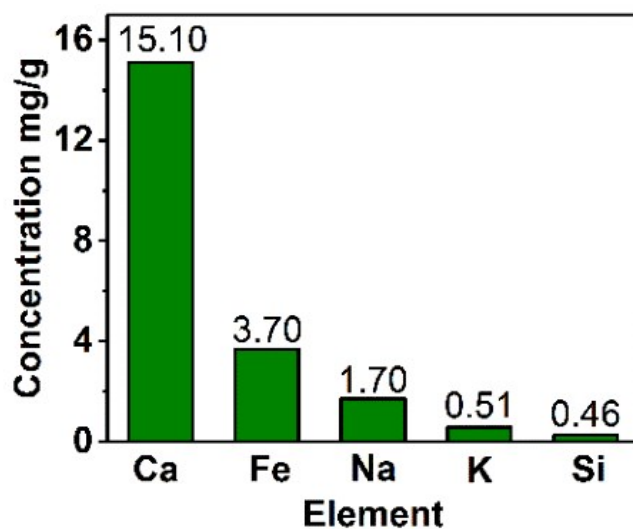


Fig. S5. The data of ICP-AES measurement of raw BSES.

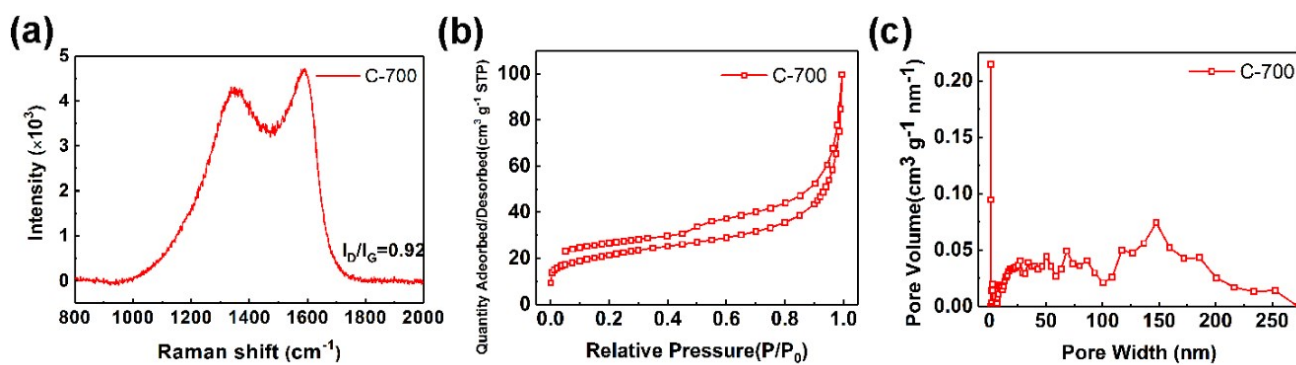


Fig. S6 (a) Raman spectrum, (b) Nitrogen adsorption–desorption isotherm, and (c) pore size distribution of C-700.

Table S1. The pore structure parameters of C700 and HPCs.

Sample	S_{BET} (m^2/g)	S_{Micro} (m^2/g)	S_{External} (m^2/g)	$S_{\text{Micro}}/S_{\text{BET}}$ (%)	V_{Total} (cm^3/g)	V_{Micro} (cm^3/g)	$V_{\text{Micro}}/V_{\text{Total}}$ (%)
C700	73.43	19.47	53.96	26.52	0.15	0.01	6.67
HPC-0.5	553.60	459.89	93.71	83.07	0.34	0.24	70.59
HPC-1	1192.00	972.50	219.50	81.59	0.71	0.52	73.24
HPC-2	1886.16	1231.82	654.34	65.31	0.92	0.49	53.26

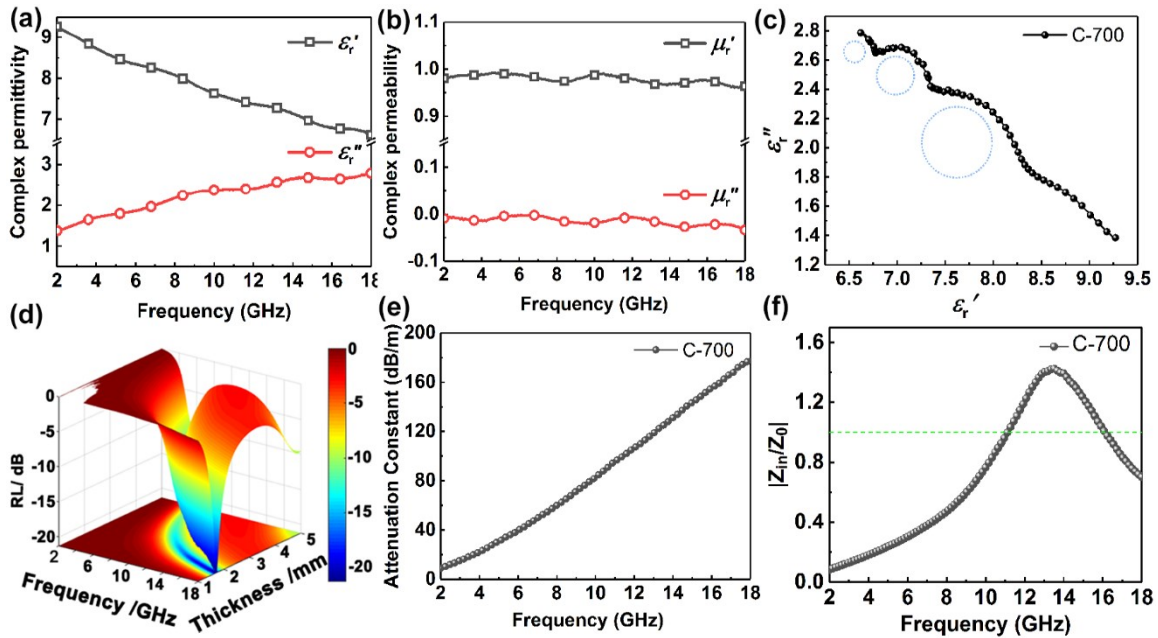


Fig. S7 Frequency dependence of (a) complex permittivity, (b) complex permeability, (c) three-dimensional map of RL, and (d) attenuation factor for C-700.

Table S2. Comparison of the microwave absorption properties of HPC-1 with the recently reported bio-derived absorbers.

Microwave absorber	Minimum RL		Effective absorption bandwidth		Ref.
	Value (dB)	f_m (GHz)	f_b /GHz (t/mm)	Filler loading (wt%)	
Porous carbon	-42.4	8.88	2.24 (1.50)	70	1
3D porous carbon	-44.6	9.15	2.20 (1.68)	30	2
Porous rGOs	-51.7	9.80	3.90 (3.50)	15	3
Carbonaceous photonic crystals	-57.9	7.30	2.10 (2.50)	30	4
Porous carbon/Fe ₃ O ₄	-43.6	7.10	3.30 (4.70)	30	5
Porous carbon/Fe ₃ O ₄	-39.5	6.40	4.00 (1.60)	50	6
Porous carbon/NiO	-33.8	16.40	2.50 (6.00)	30	7
AC/Ni(OH) ₂	-23.0	14.50	2.00 (5.50)	50	8
Porous carbon/MnO	-51.6	10.4	3.00 (2.47)	30	9
HPC-1 (BSES)	-53.6	10.40	4.00 (1.43)	20	Herein

References

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