

Supplementary Information

Facile synthesis of 3D Ni@C nanocomposites derived from two kinds of petal-like Ni-based MOFs towards lightweight and efficient microwave absorbers

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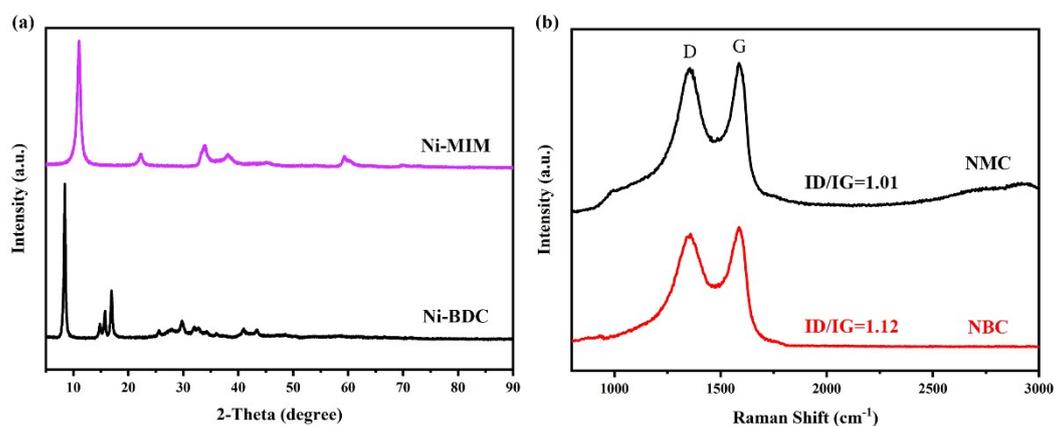


Fig. S1 (a) XRD patterns of Ni-MIM and Ni-BDC. (b) Raman spectra of NMC and NBC.

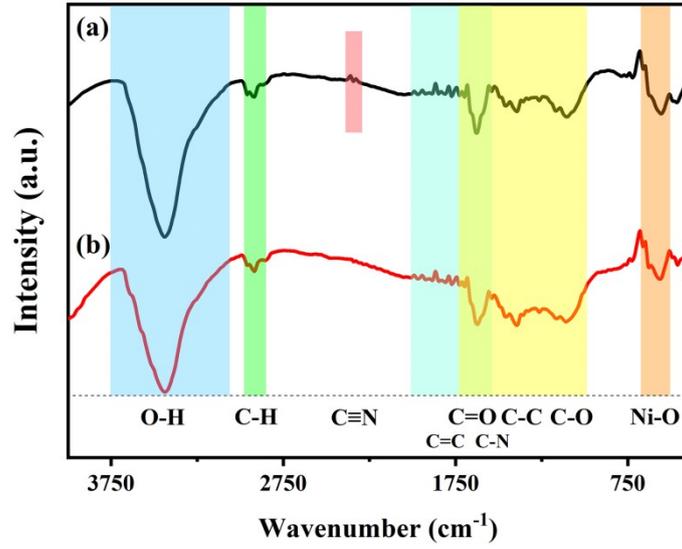


Fig. S2 FT-IR spectra of (a) NMC@GN and (b) NBC@GN.

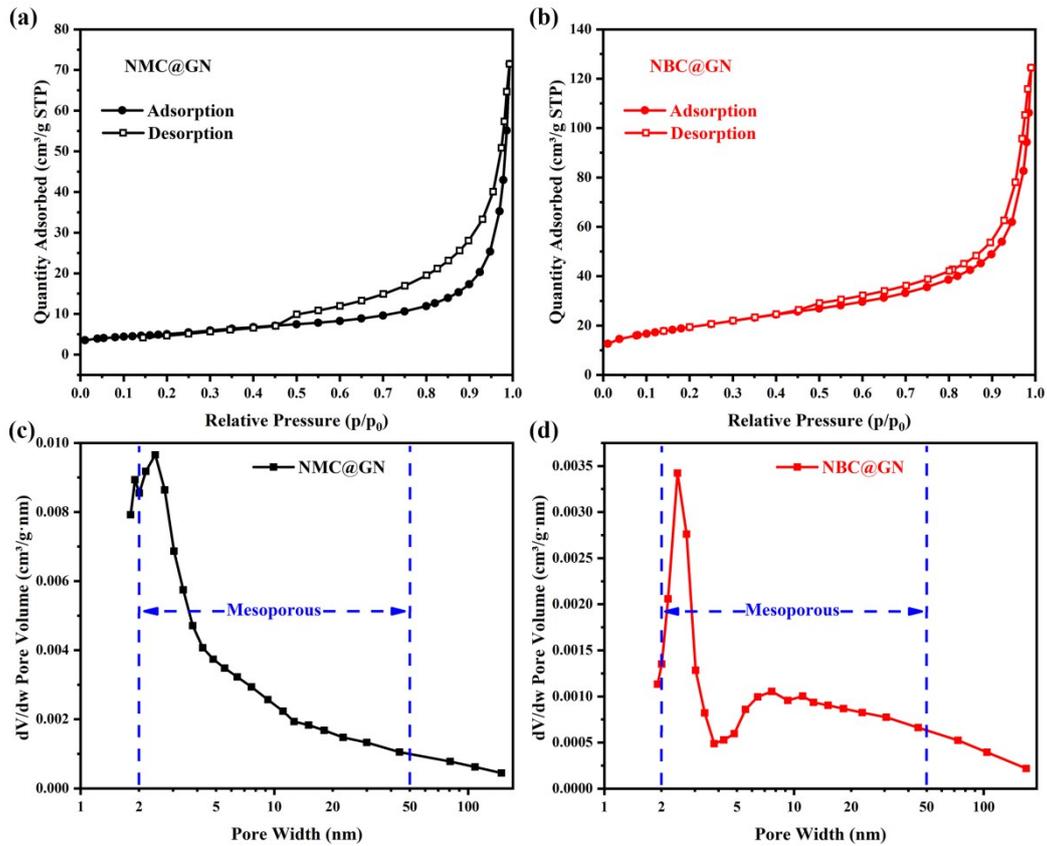


Fig. S3 N₂ adsorption–desorption isotherms and pore size distributions of (a, c) NMC@GN and (b, d) NBC@GN.

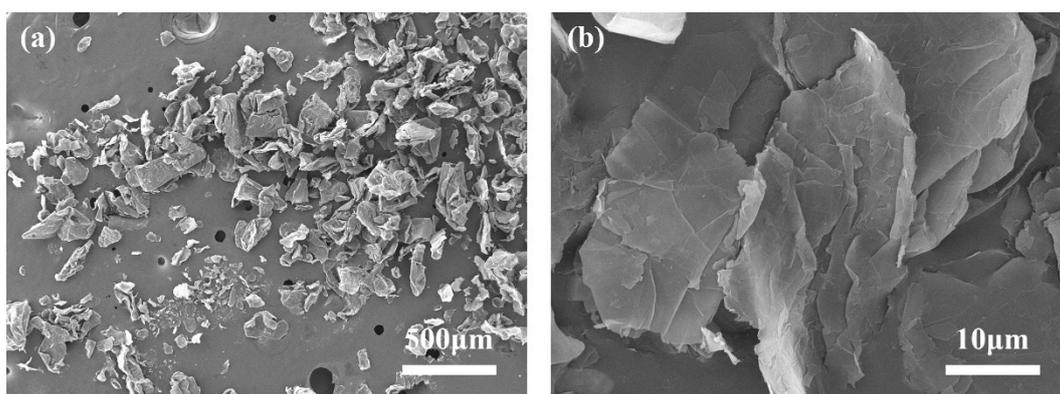


Fig. S4 SEM images of GNs.

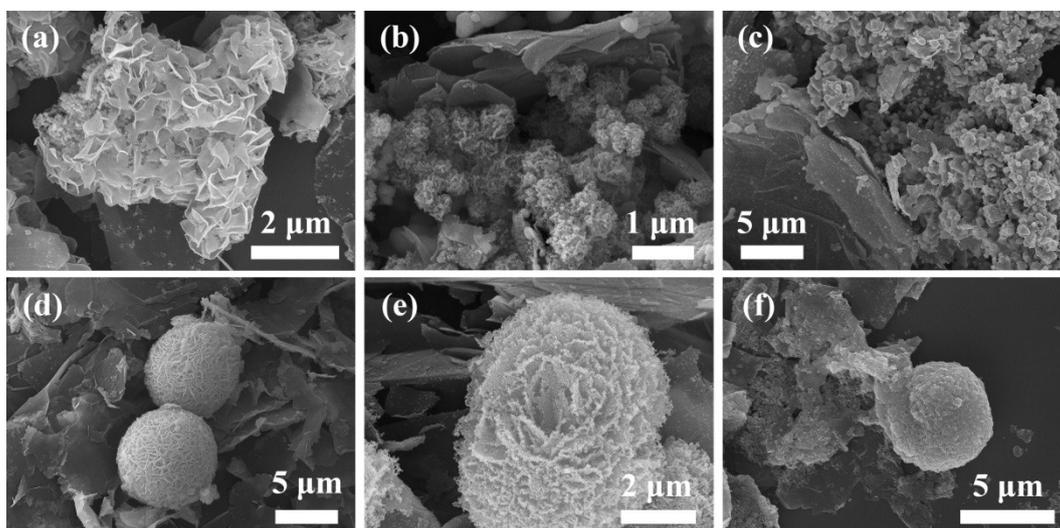


Fig. S5 SEM images of NMC@GN and NBC@GN prepared at different pyrolysis temperatures: (a) NMC@GN-300°C, (b) NMC@GN-450°C, (c) NMC@GN-600°C, (d) NBC@GN-450°C, (e) NBC@GN-600°C, (f) NBC@GN-750°C.

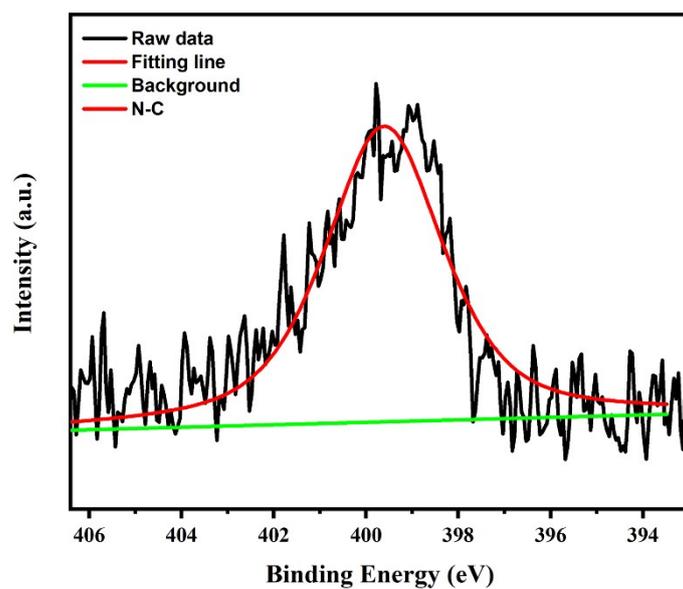


Fig. S6 N 1s spectrum of NMC@GN.

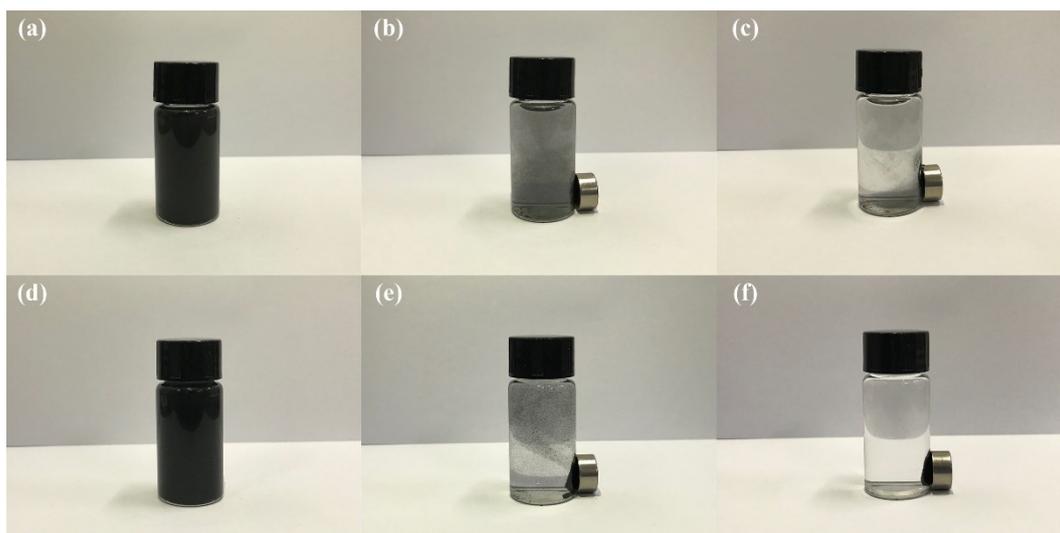


Fig. S7 Schematic diagram of actual magnetic properties of (a-c) NMC@GN and (d-f) NBC@GN.

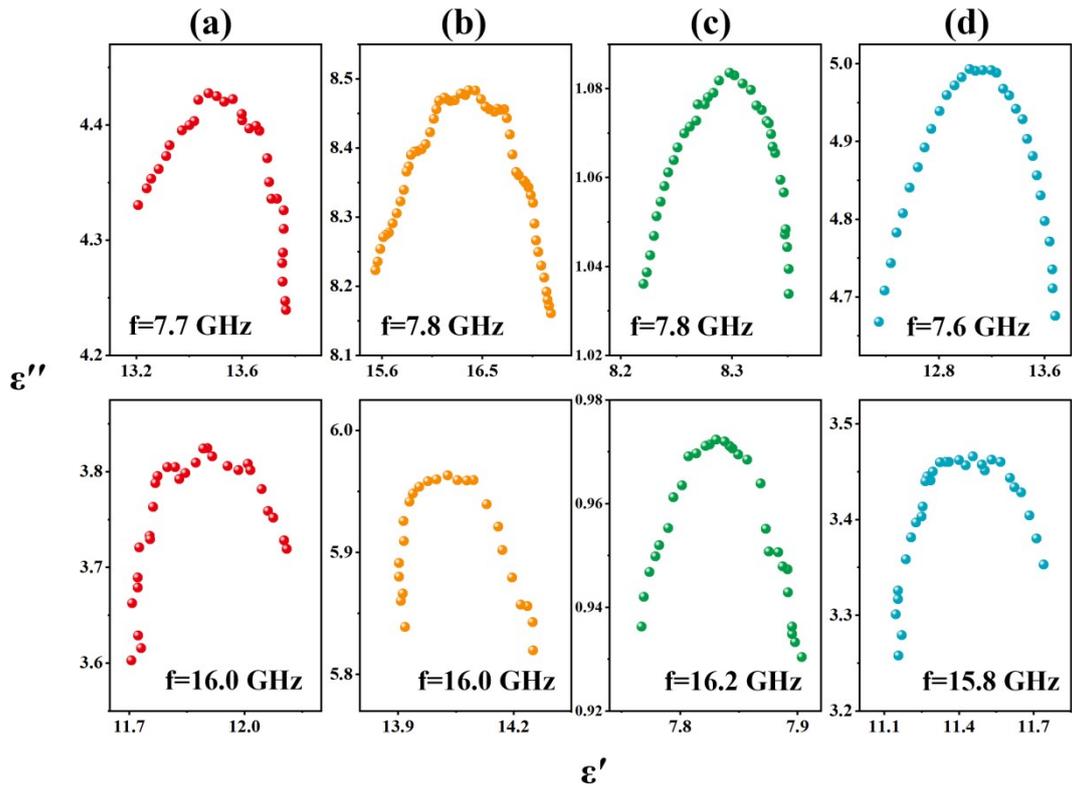


Fig. S8 The Cole-Cole plots of (a) NMC@GN-10%, (b) NMC@GN-15%, (c) NBC@GN-10%, (d) NBC@GN-15%.

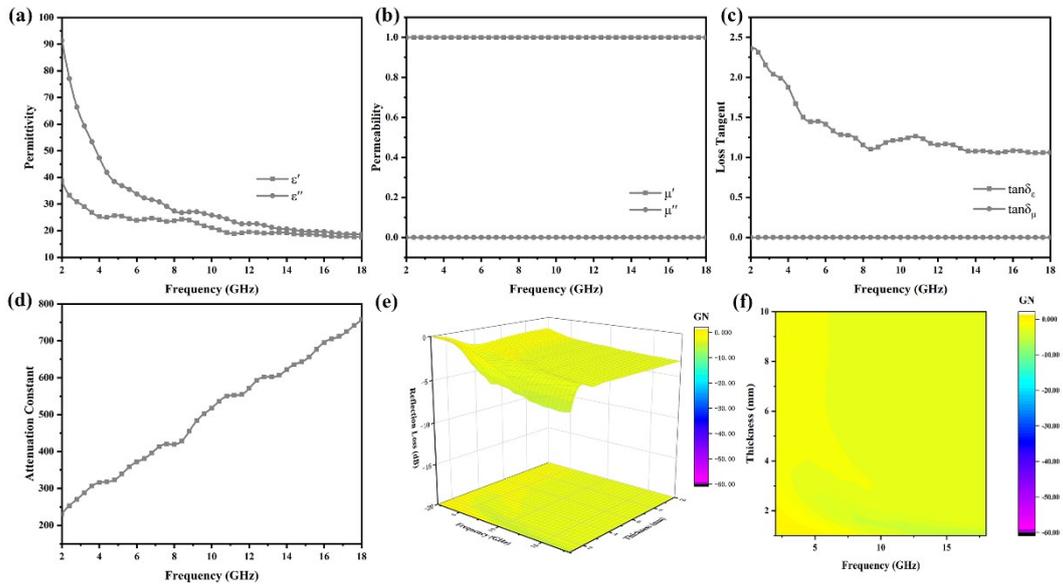


Fig. S9 Complex permittivity (a), complex permeability (b), loss tangent (c), attenuation constant (d), 3D representations of R_L (e), 2D projection (f) of GNs.

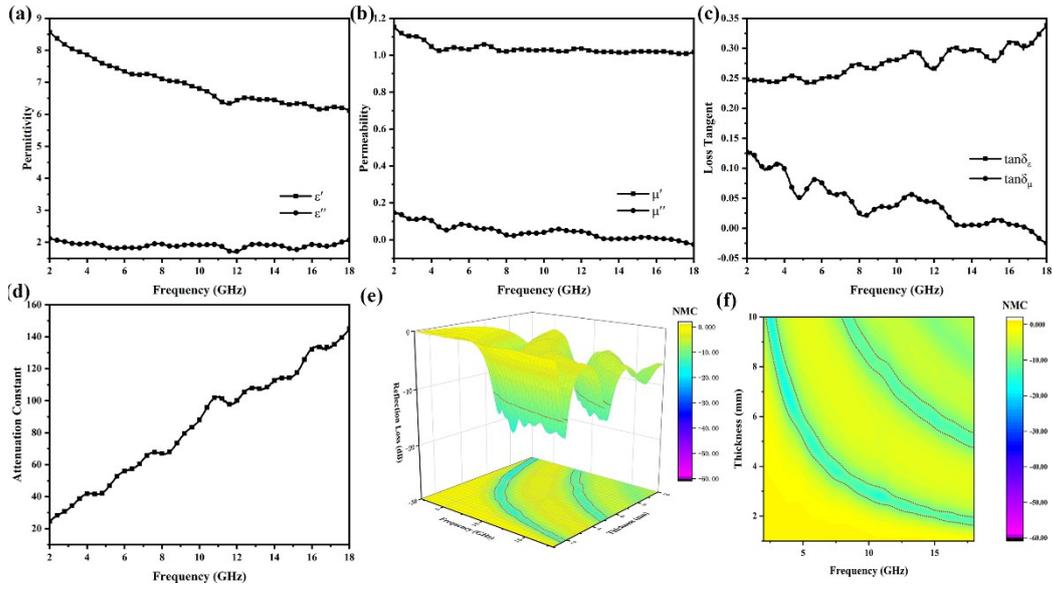


Fig. S10 Complex permittivity (a), complex permeability (b), loss tangent (c), attenuation constant (d), 3D representations of R_L (e), 2D projection (f) of pure NMC.

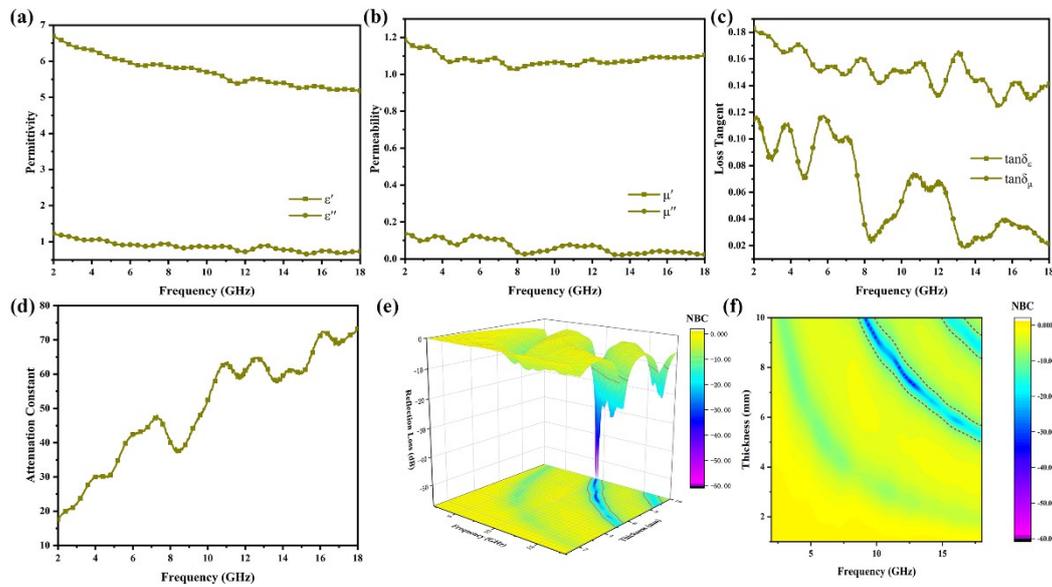


Fig. S11 Complex permittivity (a), complex permeability (b), loss tangent (c), attenuation constant (d), 3D representations of R_L (e), 2D projection (f) of pure NBC.

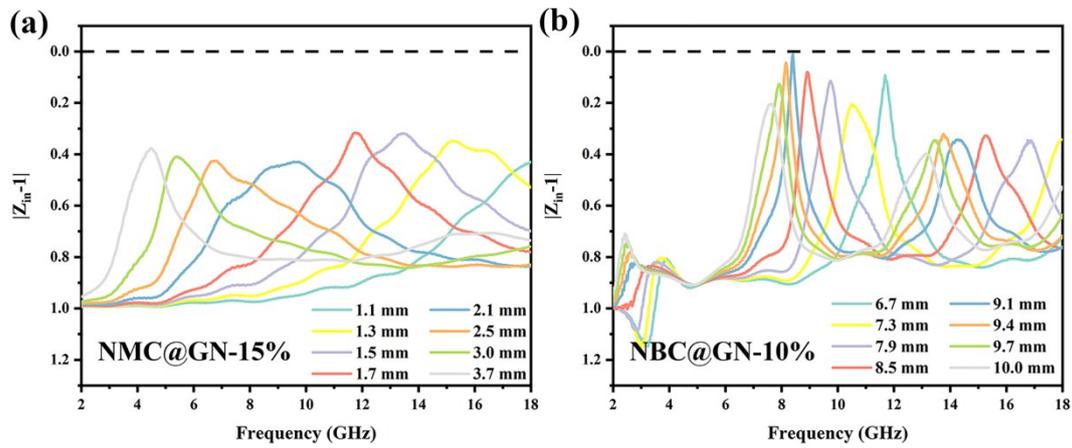


Fig. S12 Normalized input impedance of (a) NMC@GN-15% and (b) NBC@GN-10%.

	ϵ_s	ϵ_∞	τ (s)	σ (S/m)	MSE
NMC@GN-10%	112.84	3.13	9.04×10^{-11}	0.54	0.01134
NMC@GN-15%	230.21	1.64	2.36×10^{-10}	0.69	0.03622
NBC@GN-10%	35.15	7.76	3.66×10^{-11}	0.12	0.00796
NBC@GN-15%	58.43	1.56	1.13×10^{-10}	0.51	0.01953

Table. S1 Detailed fitting results of all the samples

Sample	Ratio (%)	RL _{min} (dB)	Thickness (mm)	EAB (GHz)	Ref.
Ni@C	25%	-59.5	4.5	4.7	73
CeO _{2-x} /RGO	50%	-50.6	1.5	5.84	72
Ni/C	30%	-52.4	1.6	5	14
Ni@C@ZnO	25%	-55.8	2.5	4.1	71
Co@NC	25%	-53.0	1.8	6.2	74
Ni@C-ZIF	40%	-86.8	2.7	2.14	16
H-Co/C	10%	-50.7	2.9	4.6	20

Co- C/MWCNTs	15%	-48.9	-	2.99	22
Co@NC@RGO	50%	-46.5	3.5	4.72	49
NC@Co/NC	25%	-52.5	2.2	4.4	10
NMC@GN	10%	-53.99	1.4	4.39	this work
NBC@GN	15%	-49.58	1.4	4.03	this work

Table. S2 Comparison of microwave absorption properties of MOFs derived materials in recent references and this work.