Supporting Information

Melamine-induced formation of carbon nanotubes assembly on metal-organic framework-derived Co/C composites for lightweight and broadband microwave absorption

Wei Liu,[abc] Pengtao Duan,[ab] Chao Mei,[ab] Kun Wan,[ab] Bowei Zhang,[abc] Hailin Su,*[abcd] Xuebin Zhang,*[abc], Jinzhi Wang,*[d] and Zhongqiu Zou[b,c]

a School of Materials Science and Engineering and Anhui Provincial Key Laboratory of Advanced Functional Materials and Devices, Hefei University of Technology, Hefei, 230009, China

b Huaian Engineering Research Center of Soft Magnetic Powder Cores and Devices, Jiangsu Red Magnetic Materials Incorporation, Huaian, 211700, China

c Anhui Red Magneto-electric Technology Co., Ltd., Wuhu, 241002, China

d School of Materials and Chemistry Engineering, Ningbo University of Technology, Ningbo, 315211, China

Corresponding Author

Email: hailinsu@hfut.edu.cn; zzhhxxbb@126.com; wangjz@nbut.edu.cn

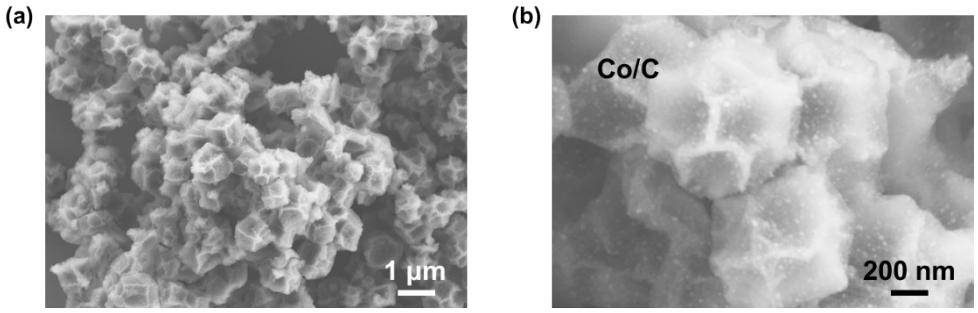

Fig. S1 SEM images of Co/C nanoparticles derived from ZIF-67.

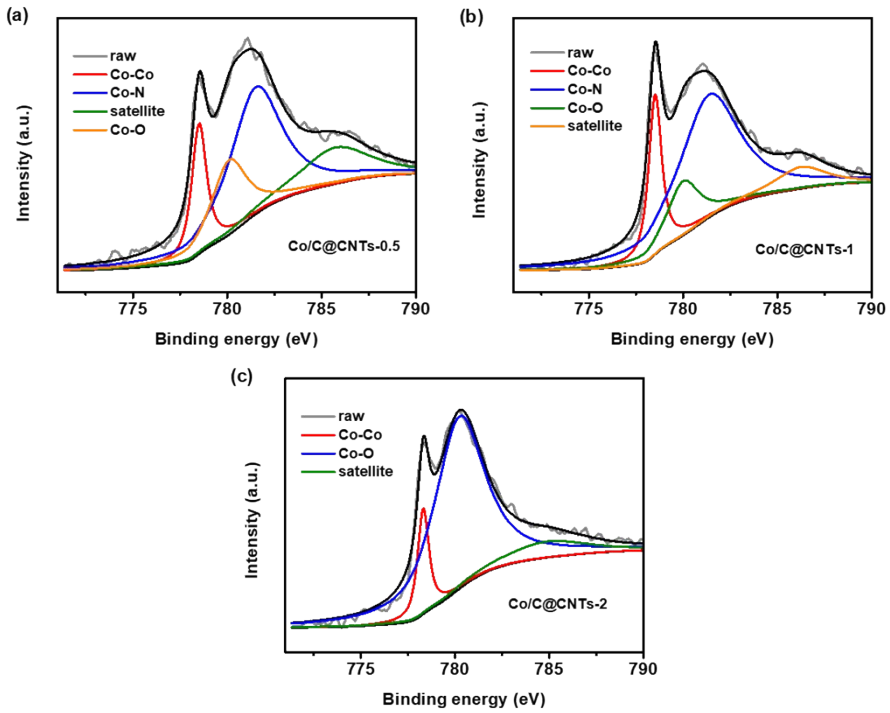

Fig. S2 High resolution Co 2p XPS spectra of (a) Co/C@CNTs-0.5, (b) Co/C@CNTs-1 and (c) Co/C@CNTs-2.

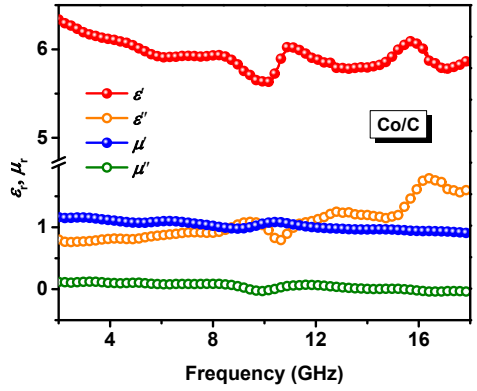

Fig. S3 Complex permittivity and permeability spectra of Co/C composites.

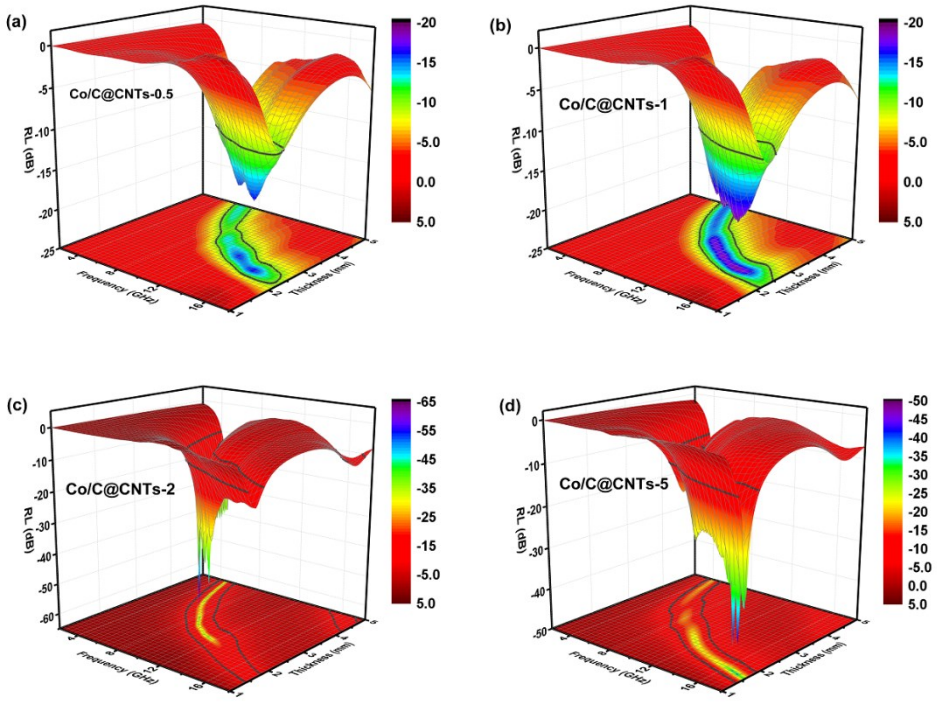

Fig. S4 3D reflection loss graphs of (a) Co/C@CNTs-0.5, (b) Co/C@CNTs-1, (c) Co/C@CNTs-2 and (d) Co/C@CNTs-5.

Table S1 Comparison of microwave absorption performance of similar microwave absorbing materials

samples	filling ratio (wt%)	thickness (mm)	RL (dB)	EAB (GHz)	Ref.
Fe_3N@C	65	1.5	-31.8	6	1
CoS_2/NCNTs	50	1.6	-65	4.2	2
NC@Co/NC carbon nanocages	25	2.2	-52.5	4.4	3
F6	40	3.07	-52.9	4.64	4
Fe_3O_4@N-doped carbon nanochains	20	3.1	-63.09	5.34	5
Mo_2N@CoFe@C/CNT	20	2	-53.5	5.0	6
HPCNs-3	25	1.6	-18.13	5.17	7
Fe@N-doped C	~50	2.1	-60.0	4.48	8
CN-Ce	20	2.3	-50.36	3.83	9
ZnNiC	50	1.6	-66.1	4.4	10
Co/N/C@MnO_2	15	3.7	-58.9	5.5	11
Co/C@CNTs-2	20	2.8	-45.13	4.4	this
Co/C@CNTs-5	20	1.9	-22.22	5.6	work

References

1 X. Cui, X. Liang, W. Liu, W. Gu, G. Ji and Y. Du, *Chem. Eng. J.*, 2020, **381**, 122589.

2 J. Yan, Y. Huang, X. Han, X. Gao and P. Liu, *Compos. Part. B-Eng.*, 2019, **163**, 67-

76.

3 P. Liu, S. Gao, Y. Wang, Y. Huang, W. He, W. Huang, J. Luo, *Chem. Eng. J.*, 2020, **381**, 122653.

4 N. Wu, D. Xu, Z. Wang, F. Wang, J. Liu, W. Liu, Q. Shao, H. Liu, Q. Gao and Z. Guo, *Carbon*, 2019, **145**, 433-444.

5 M. Qiao, X. Lei, Y. Ma, L. Tian, X. He, K. Su and Q. Zhang, *Nano Res.*, 2018, **11**, 1500-1519.

6 C. Xu, L. Wang, X. Li, X. Qian, Z. Wu, W. You, K. Pei, G. Qin, Q. Zeng, Z. Yang, C. Jin and R. Che, *Nano-Micro Lett.*, 2021, **13**, 47.

7 J. Tao, J. Zhou, Z. Yao, Z. Jiao, B. Wei, R. Tan and Z. Li, *Carbon*, 2021, **172**, 542-555.

8 Q. Liu, M. Zeng, J. Liu, B. Guo, X. Hao, Q. Cao, Y. Shang, X. Sun, J. Liu, X. Gao, J. Li, J. Zhu, X. Zhang and R. Yu, *Carbon*, 2021, **171**, 646-657.

9 S. Gao, G. S. Wang, L. Guo and S. H. Yu, *Small*, 2020, 1906668.

10 P. Miao, J. Cao, J. Kong, J. Li, T. Wang and K. J. Chen, *Nanoscale*, 2020, **12**, 13311-13315.

11 R. Wang, M. He, Y. Zhou, S. Nie, Y. Wang, W. Liu, Q. He, W. Wu, X. Bu and X. Yang, *Carbon*, 2020, **156**, 378-388.