Supplementary Information (SI) for Nanoscale.

Supplementary Information

Broadband Microwave-Absorbing GO-CNT Nanocomposites Enabled by Synergistic FeCoNi Ternary Catalysis

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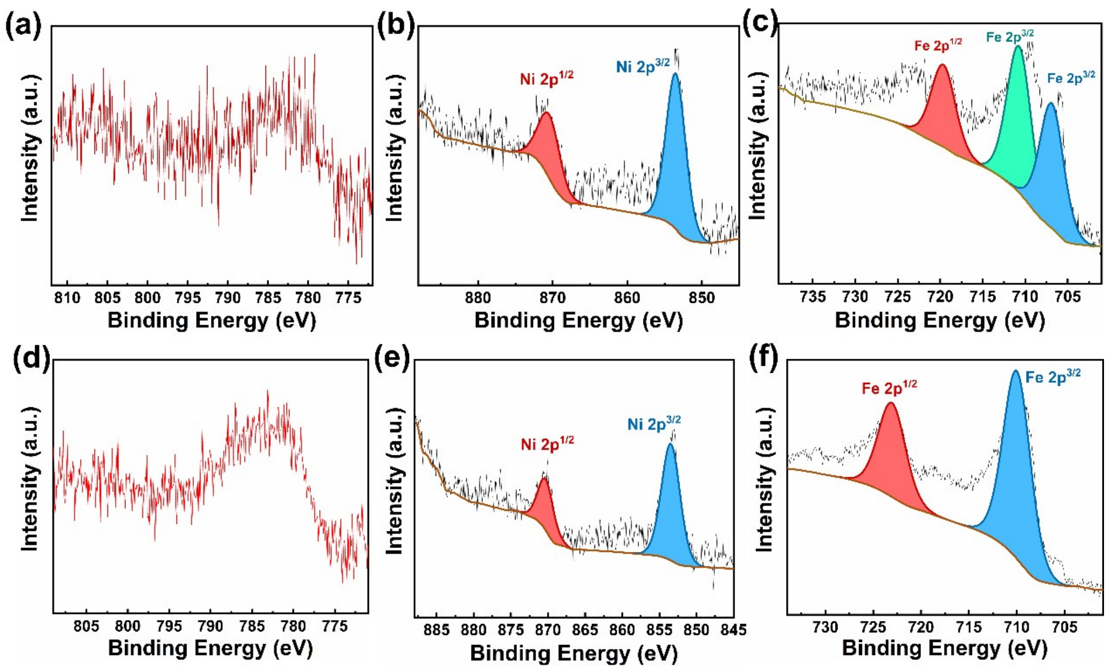

Fig. S1 High-resolution XPS spectra of(a)Co 2p, (b)Ni 2p, (c)Fe 2p for GO-CNTs and (d)Co 2p, (e)Ni 2p, (f)Fe 2p for GO-CNTs-O

Table1. Comparison of the Microwave Absorption Performance of This Work with Other Absorbents Based on Carbon nanomaterials

Materials	**RL_{min} (dB)**	**EAB (GHz)**	**Thickness (mm)**	**Ref**
CoNi/FA	-39.8	3.4	2.0	1
CNTs/PMMA	-19.35	3.53	1.5	2
CNT-rGO-Co/Ni-MOF	-43.0	4	1.5	3
GO/CNTs/ERA	-39.60	4.08	1.8	4
CNT/GNP	-25	4.6	2	5
RGO-$NiCo_2O_4$	-42.10	4.88	1.8	6
GNP/CNT-ENC	-23.61	5.18	1.5	7
TiO_2/CNT	-41.6	5.19	1.6	8
GO-CNTs	-49.40	4.33	2.2	This work
GO-CNTs-O	-35.44	5.33	1.8	

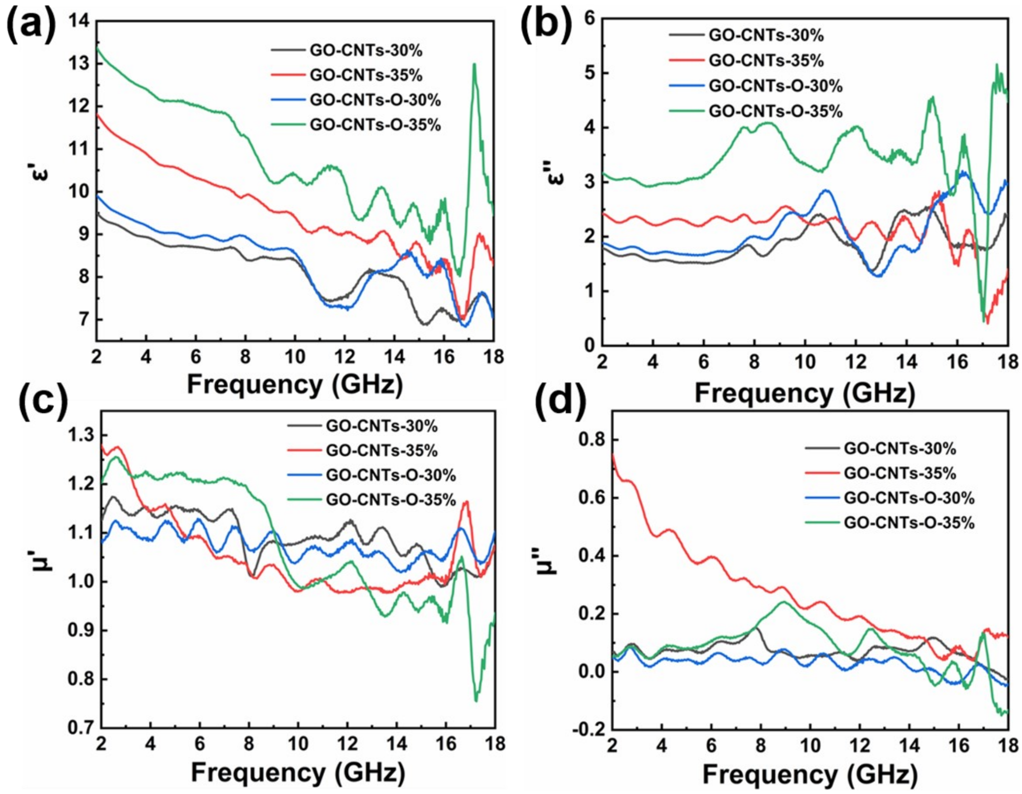

Fig. S2 (a) ε′, (b)ε′′, (c) μ′, (d) μ′′ of GO-CNTs and GO-CNTs-O at different filling ratios

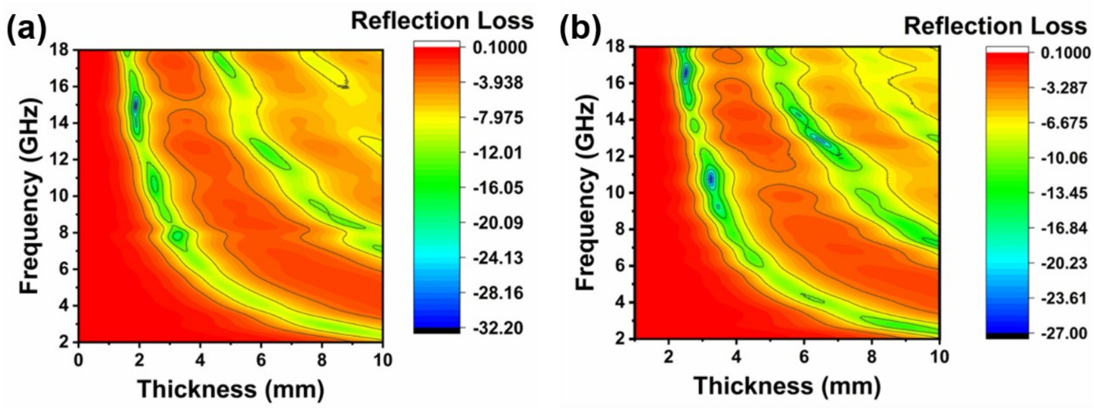

Fig. S3 Impedance matching of (a)GO-CNTs and (b)GO-CNTs-O at a filling ratio of 30 wt%

By comparing the electromagnetic parameters at different filling ratio, it can be seen that when the filling ratio is 30 wt%, both dielectric loss and magnetic loss are relatively low, which is not conducive to impedance matching. However, when the filling ratio is 35 wt%, the dielectric loss has significantly increased, which can enhance the electromagnetic wave absorption. Then, the electromagnetic wave absorption performance with a filling ratio of 30 wt% was calculated to RL_{min} of -30.2 dB for GO-CNTs and RL_{min} of –26.28 dB for GO-CNTs-O, which was found to be quite different from that at 35 wt% (-49.4 dB for GO-CNTs and RL_{min} of –35 dB for GO-CNTs-O). Therefore, a filling ratio of 35 wt% was ultimately selected.

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