

## **Facile design of mesoporous spherical cerium oxide@reduced graphene oxide nanocomposites with excellent microwave absorption**

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Keywords: microwave absorbing material, reduced graphene oxide, three-dimensional framework structure, CeO<sub>2</sub>, multi-walled carbon nanotubes

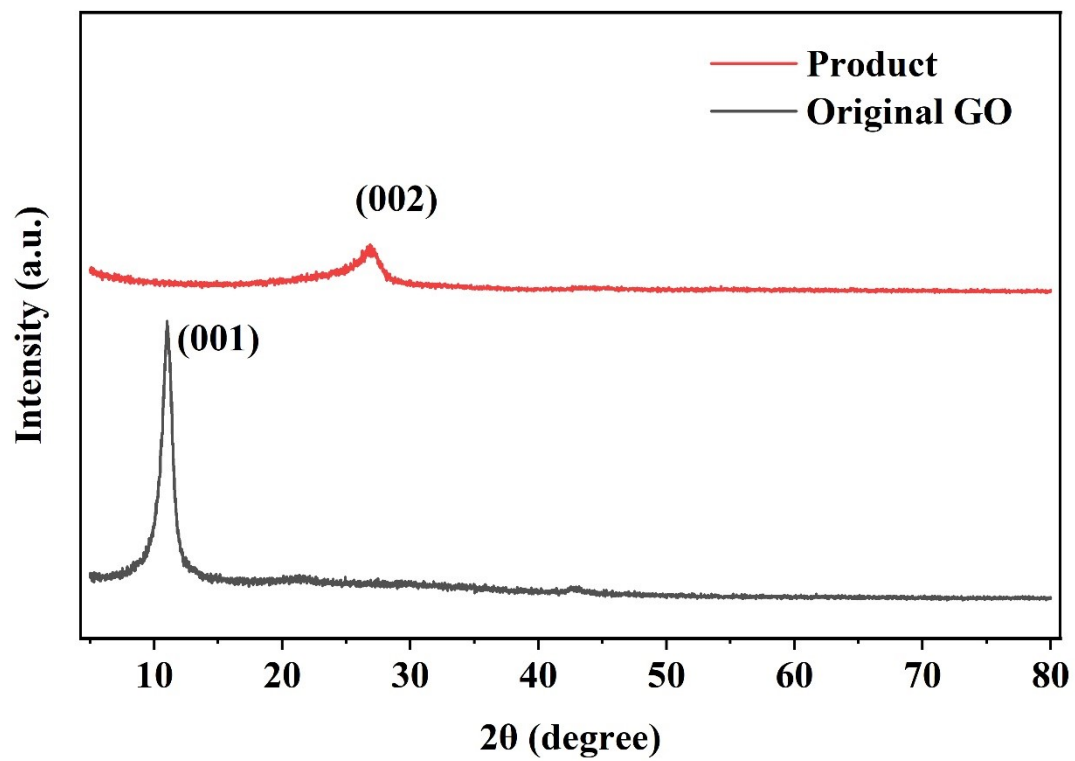


Figure S1. Comparison of the XRD patterns of RGO and original GO

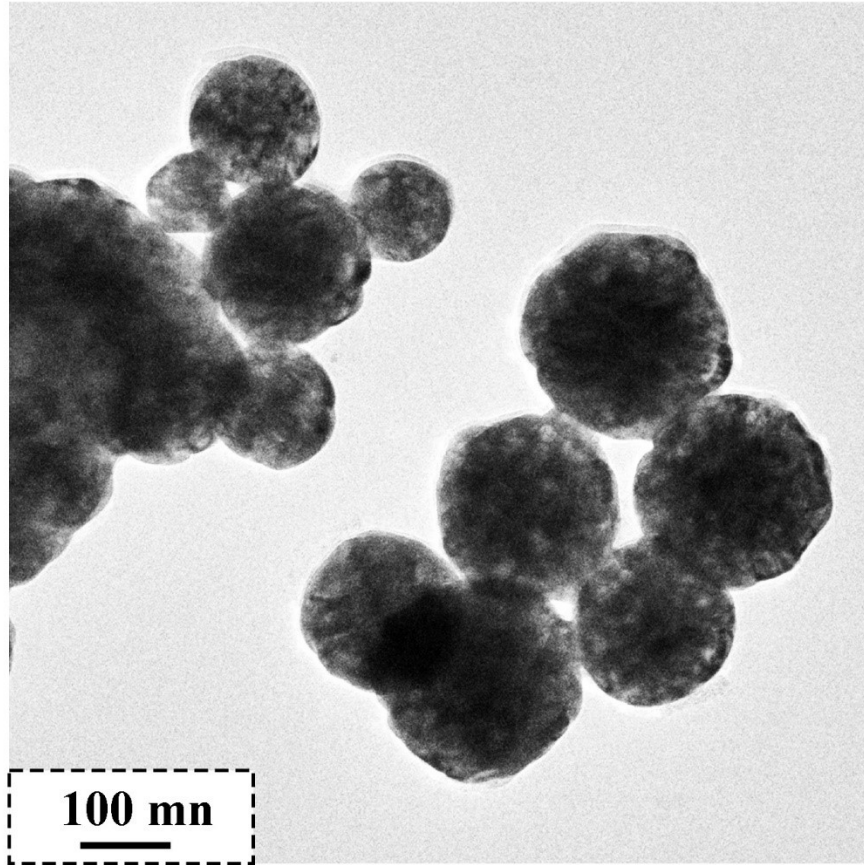


Figure S2. TEM image of mesoporous spherical CeO<sub>2</sub>

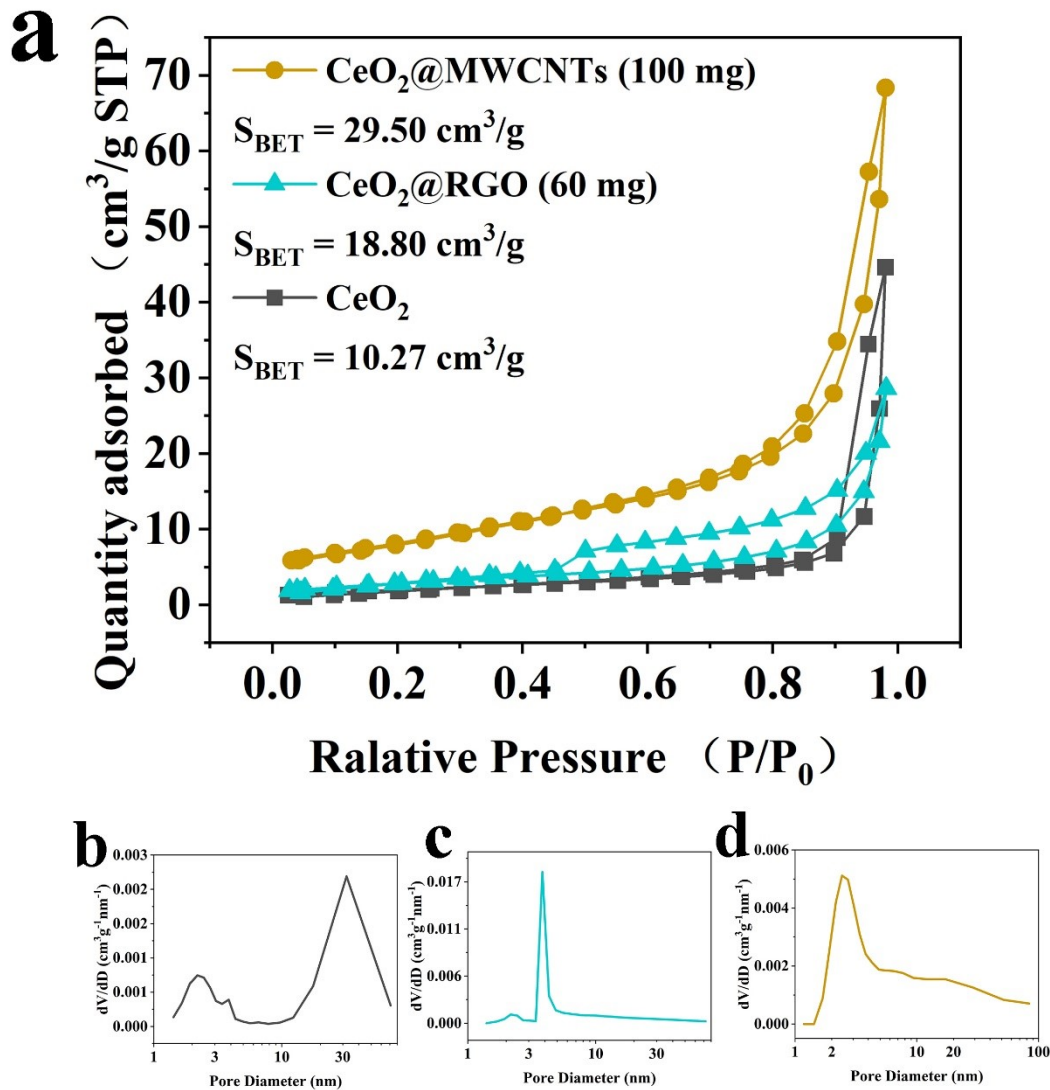


Figure S3. (a) Nitrogen adsorption-desorption isotherm of pure  $\text{CeO}_2$ ,  $\text{CeO}_2\text{@RGO}$  (60 mg) and  $\text{CeO}_2\text{@MWCNTs}$  (100 mg), and pore size distributions of (b) pure  $\text{CeO}_2$ , (c)  $\text{CeO}_2\text{@RGO}$  (60 mg) and (d)  $\text{CeO}_2\text{@MWCNTs}$  (100 mg).

Table S1. Microwave absorption properties of CeO<sub>2</sub>@RGO under different experimental parameters.

GO	Ratio (wt%)	RL <sub>min</sub> (dB)	EAB (GHz)	Thickness (mm)
40 mg	20	-22.69	1.75	2.77
/	30	-56.49	5.34	1.60
/	40	-36.29	4.08	1.49
60 mg	20	-61.92	5.88	1.77
/	30	-55.03	6.46	1.39
/	40	-16.49	4.13	1.34
80 mg	20	-9.01	-	-
/	30	-51.94	4.80	2.83
/	40	-12.64	3.28	1.34

Table S2. Microwave absorption properties of CeO<sub>2</sub>@MWCNTs under different experimental parameters.

MWCNTs	Ratio (wt%)	RL <sub>min</sub> (dB)	EAB (GHz)	Thickness (mm)
40 mg	20	-17.29	1.66	4.99
/	30	-60.04	3.55	2.72
/	40	-54.26	4.62	1.49
/	50	-18.77	3.99	1.27
60 mg	30	-71.80	4.62	1.64
/	40	-19.18	4.94	1.47
/	50	-12.16	2.42	1.08
80 mg	20	-57.57	4.33	1.72
/	30	-46.12	5.75	1.62
/	40	-8.60	-	-
100 mg	20	-54.60	4.04	4.28
/	30	-35.00	6.51	1.77
/	40	-11.12	0.49	2.65
120 mg	20	-61.55	4.22	2.58
/	30	-32.43	4.80	2.33

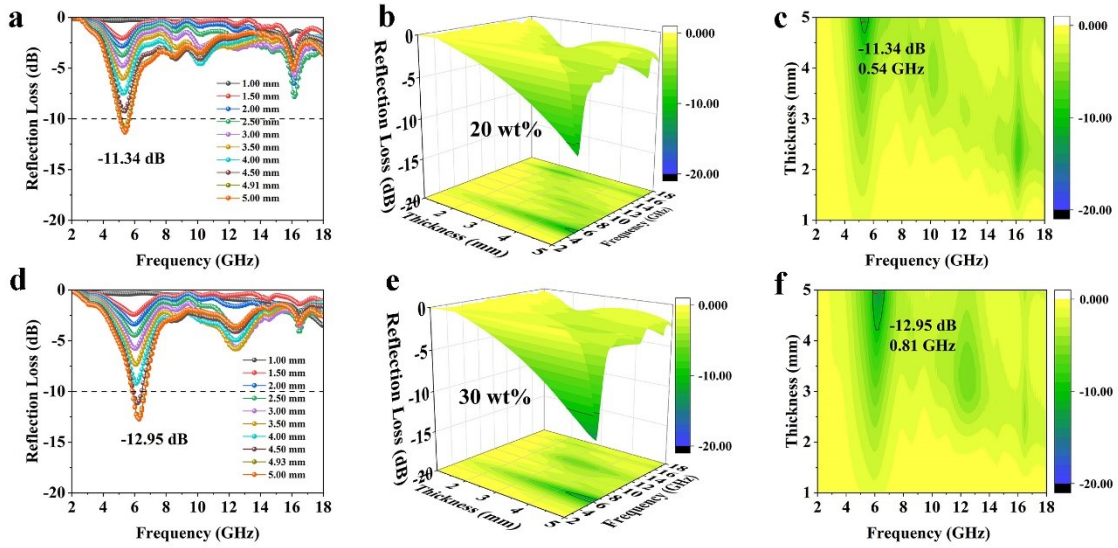


Figure S4. The RL curves, 3D and 2D color map of  $\text{CeO}_2$  (a-c) 20 wt%, (d-f) 30 wt%.

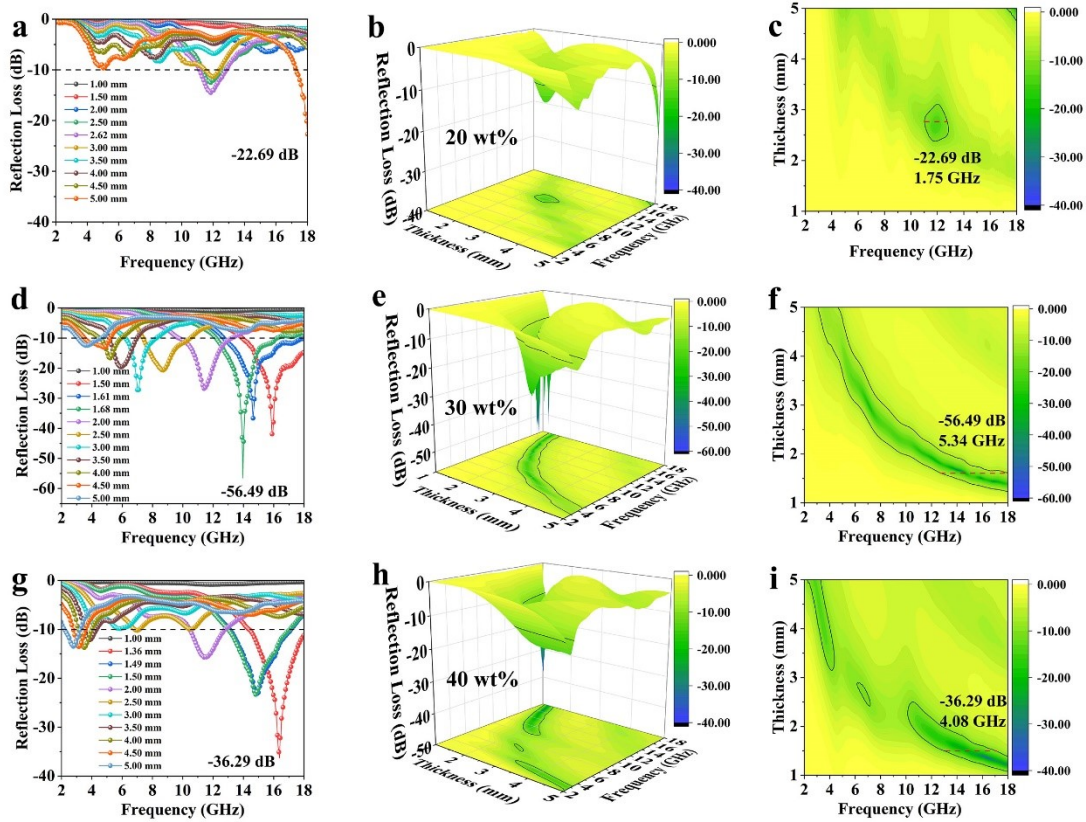


Figure S5. The RL curves, 3D and 2D color map of  $\text{CeO}_2@RGO$  (40 mg) with different filling ratios, (a-c) 20%, (d-f) 30%, and (g-i) 40%.

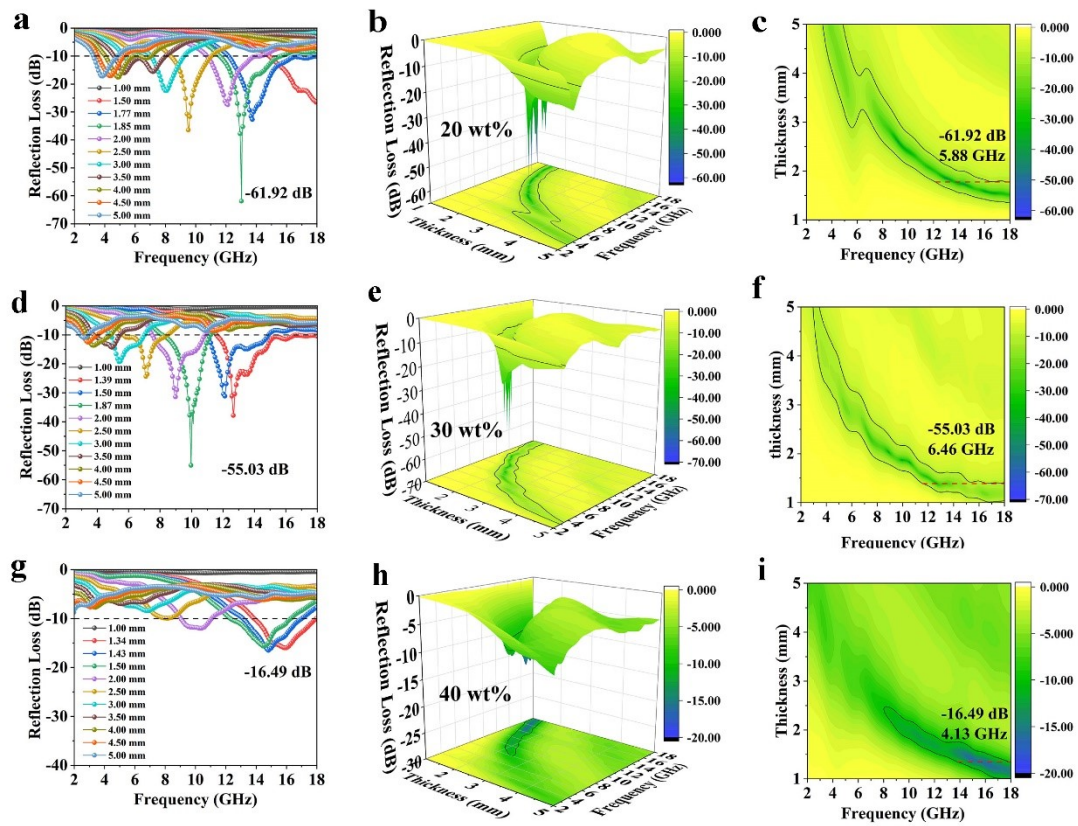


Figure S6. The RL curves, 3D and 2D color map of CeO<sub>2</sub>@RGO (60 mg) with different filling ratios, (a-c) 20%, (d-f) 30%, and (g-i) 40%.



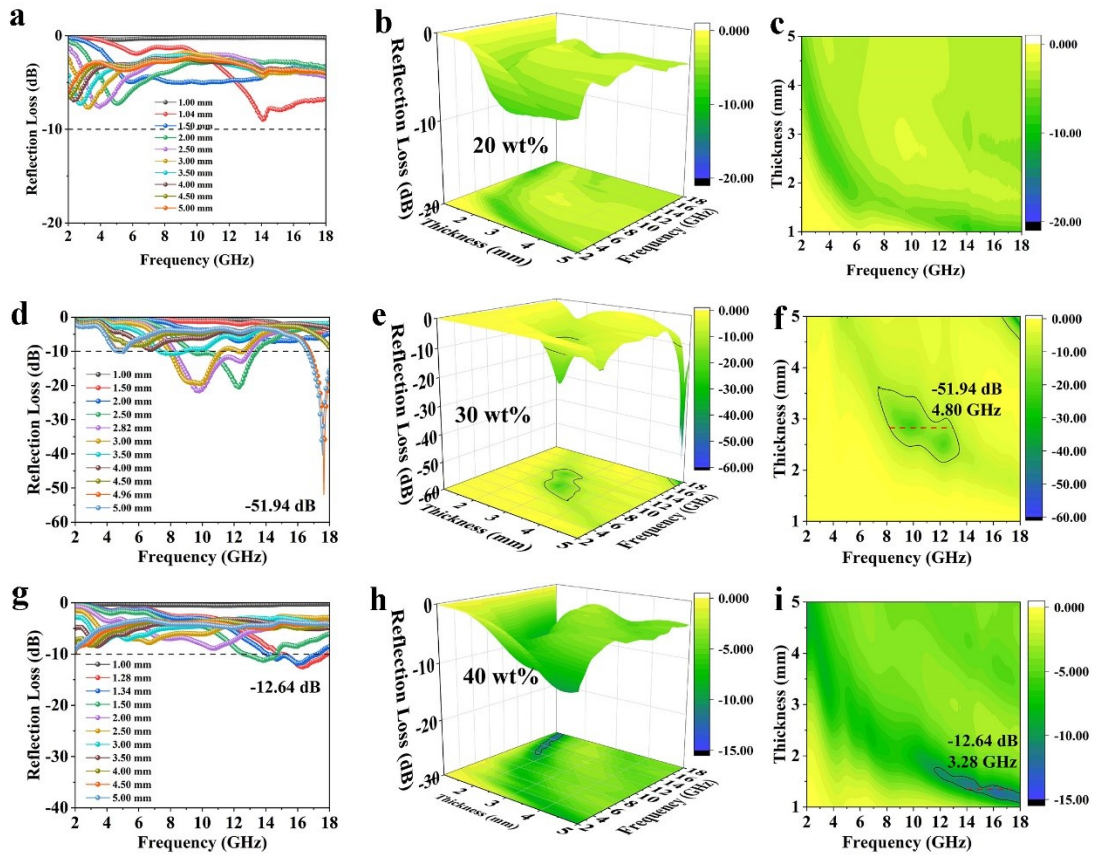


Figure S7. The RL curves, 3D and 2D color map of CeO<sub>2</sub>@RGO (80 mg) with different filling ratios, (a-c) 20%, (d-f) 30%, and (g-i) 40%.

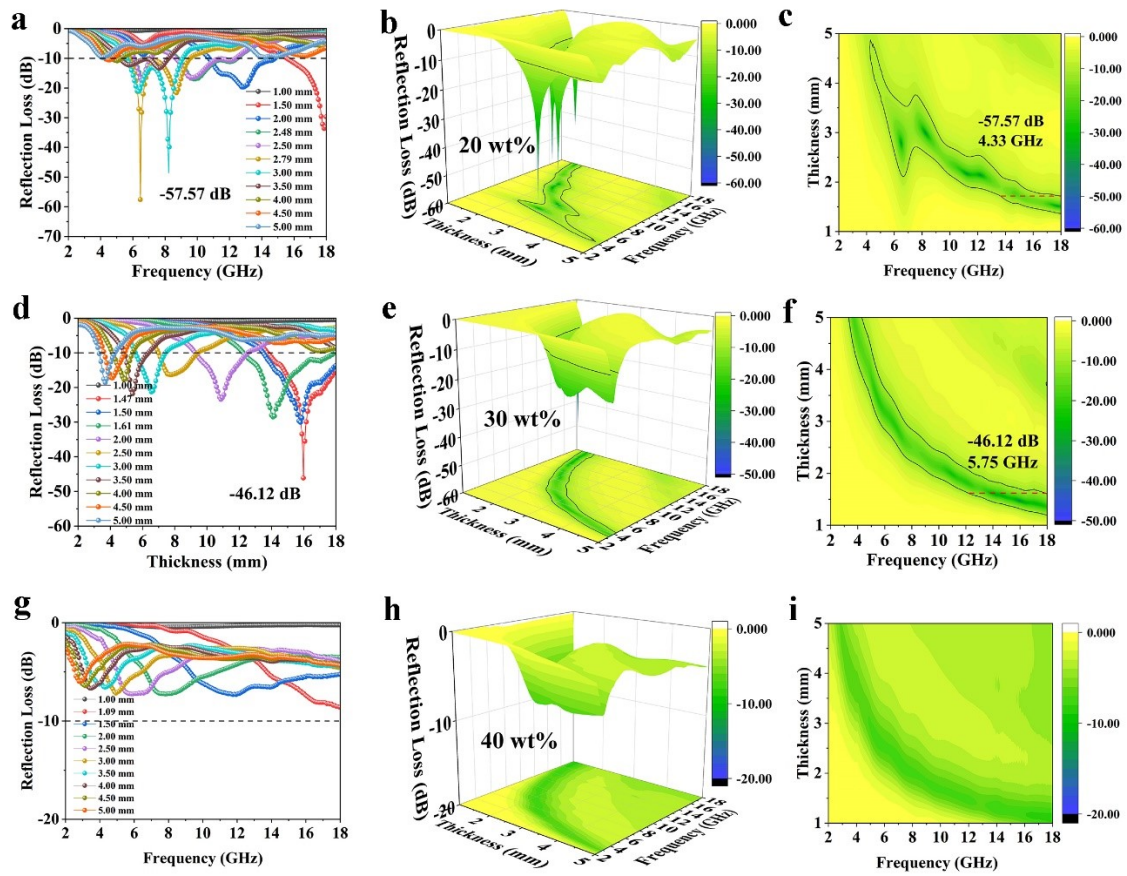


Figure S8. The RL curves, 3D and 2D color map of  $\text{CeO}_2@\text{MWCNTs}$  (80 mg) with different filling ratios, (a-c) 20%, (d-f) 30%, and (g-i) 40%.

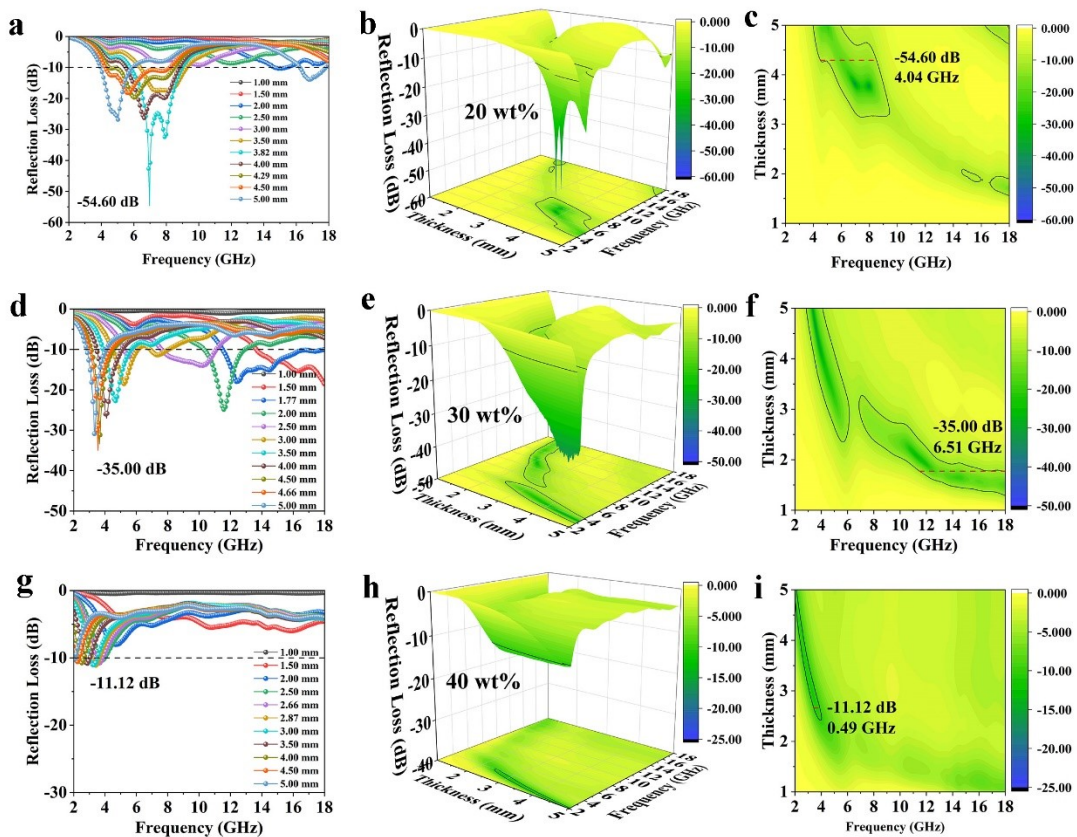


Figure S9. The RL curves, 3D and 2D color map of CeO<sub>2</sub>@MWCNTs (100 mg) with different filling ratios, (a-c) 20%, (d-f) 30%, and (g-i) 40%.

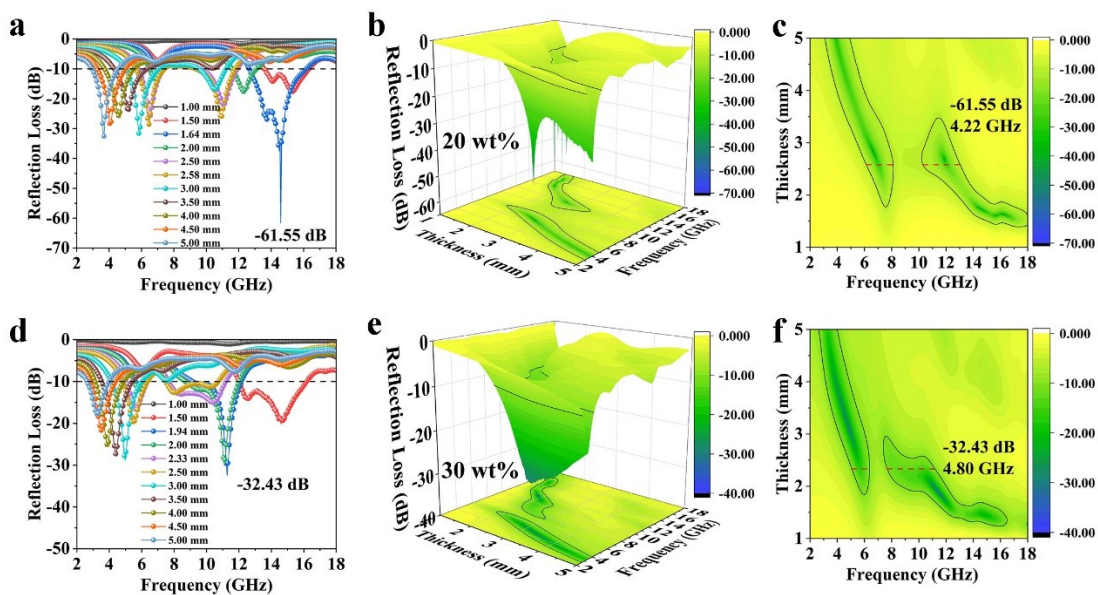


Figure S10. The RL curves, 3D and 2D color map of CeO<sub>2</sub>@MWCNTs (120 mg) with



different filling ratios, (a-c) 20% and (d-f) 30%

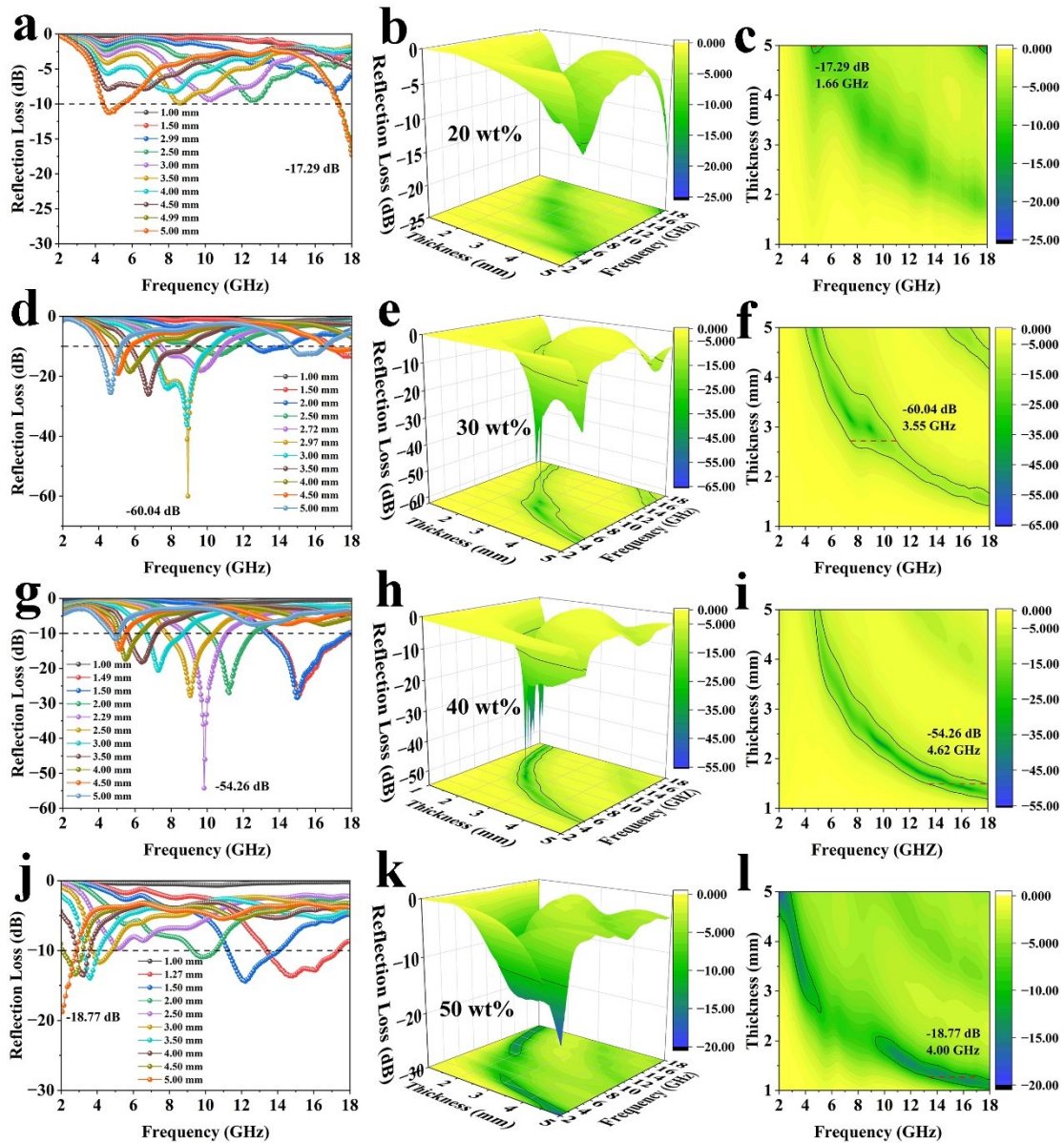


Figure S11. The RL curves, 3D and 2D color map of CeO<sub>2</sub>@MWCNTs (40 mg) (a-c) 20 wt%, (d-f) 30 wt%, (g-i) 40 wt%, (j-l) 50 wt%

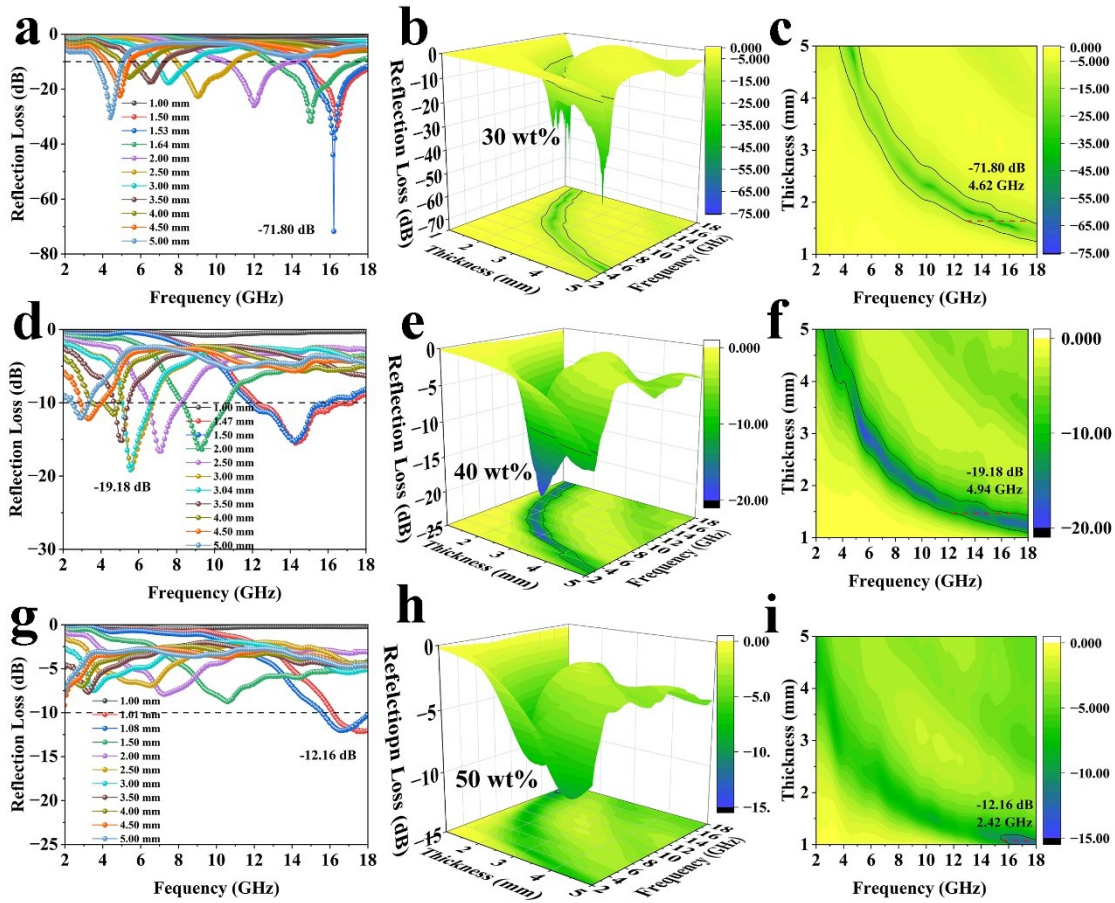


Figure S12. The RL curves, 3D and 2D color map of CeO<sub>2</sub>@MWCNTs (60 mg) (a-c) 30 wt%, (d-f) 40 wt%, (g-i) 50 wt%

