Supporting Information

Hierarchical Interfacial Engineering of SiO_2@Graphite/Co Hybrids: Synergistic Dielectric-Magnetic Loss and Superior Microwave Absorption

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Electromagnetic absorbing performance calculation

The impedance matching (Z_{in}/Z_0) can be calculated using Equations (S1):

$$Z_{in} = \left|Z_{in}/Z_0\right| = \left|(\mu_r/\varepsilon_r)^{1/2}\tanh\left[j(2\pi fd/c)(\mu_r\varepsilon_r)^{1/2}\right]\right| \quad \text{(S1)}$$

The attenuation constant (α) can be calculated using Equations (S2):

$$\alpha = \frac{\sqrt{2f\pi}}{c} \times \sqrt{(\varepsilon''\mu'' - \varepsilon'\mu') + \sqrt{(\varepsilon''\mu'' - \varepsilon'\mu')^2 + (\varepsilon'\mu'' + \varepsilon'\mu'')^2}} \quad \text{(S2)}$$

Figure

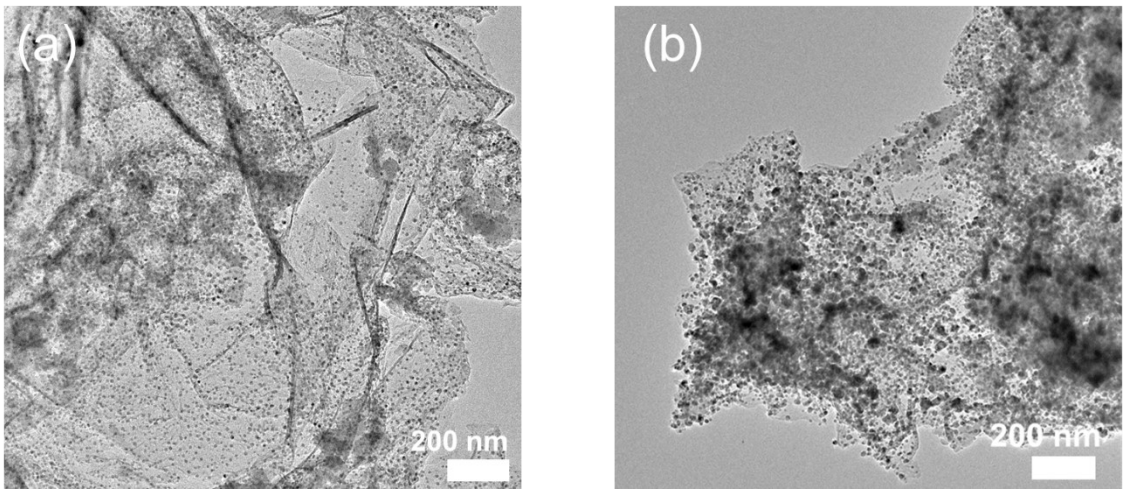

Figure S1 (a) TEM images of SiO_2@Gr/Co-10; and (b) TEM images of SiO_2@Gr/Co-15.

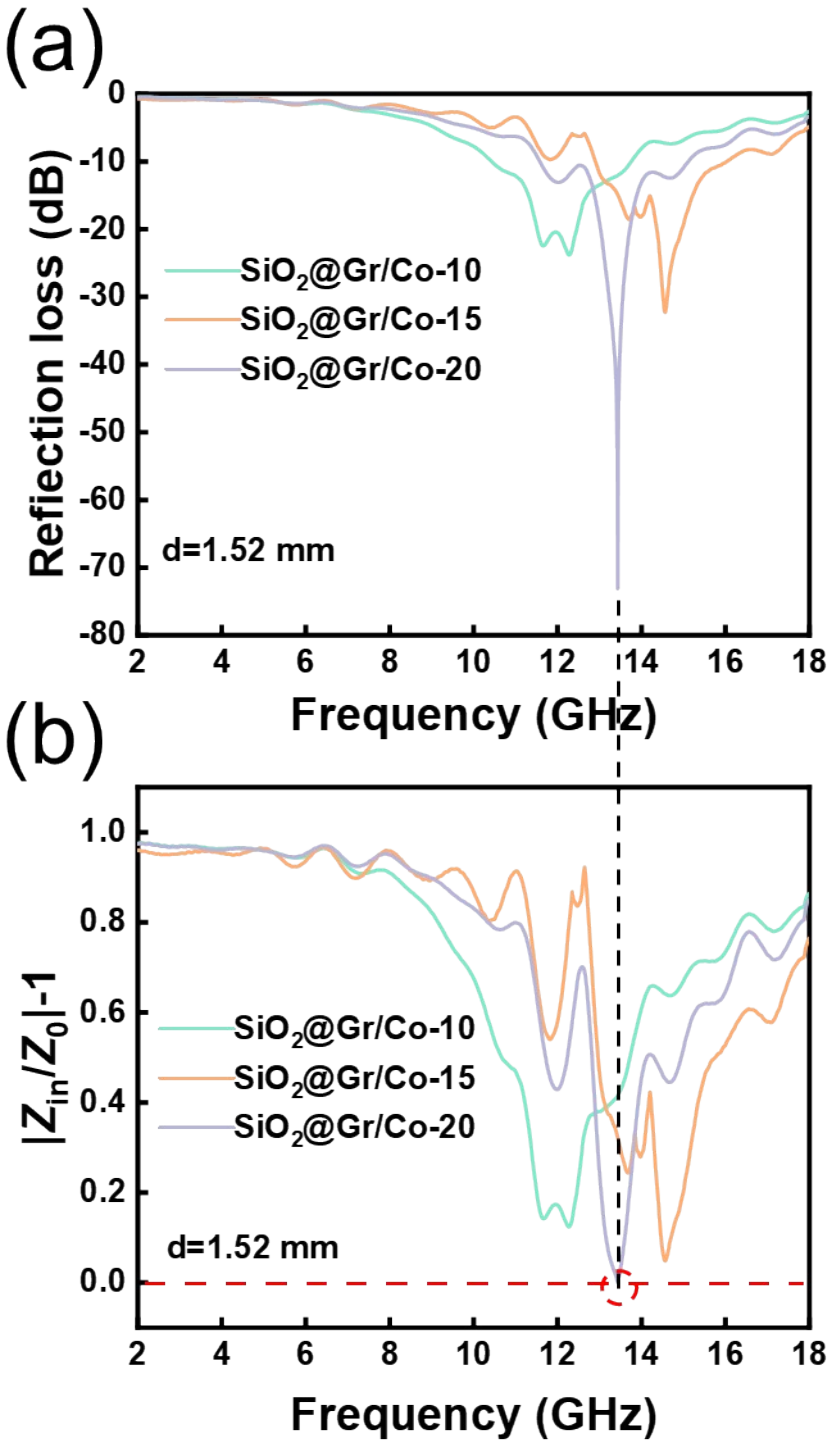

Figure S2 (a)-(b) corresponding impedance matching curves for SiO_2@Gr/Co-10, SiO_2@Gr/Co-15 and SiO_2@Gr/Co-20 at the same thickness.

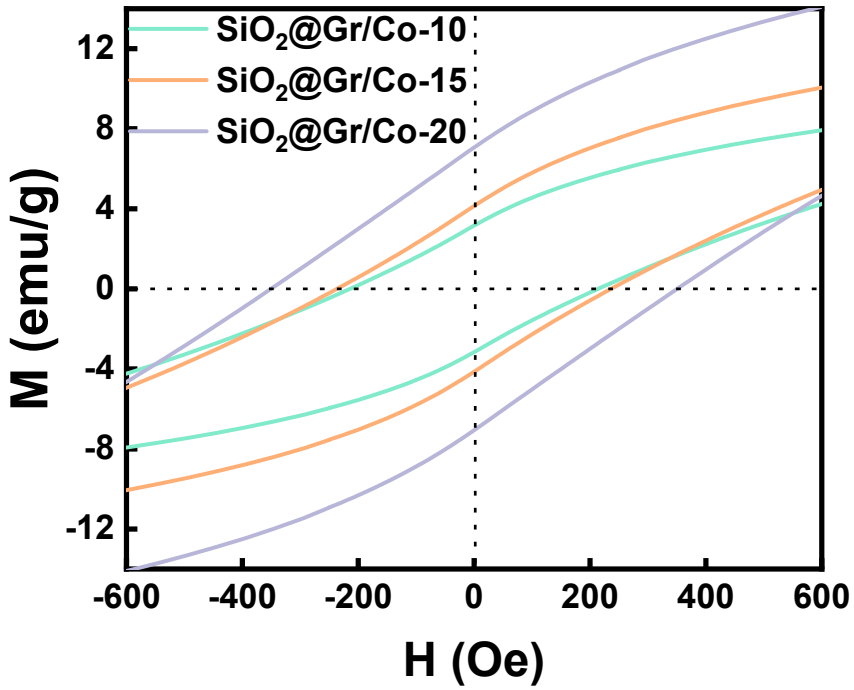

Figure S3 Magnetic hysteresis loops of SiO_2@Gr/Co-10, SiO_2@Gr/Co-15 and SiO_2@Gr/Co-20.

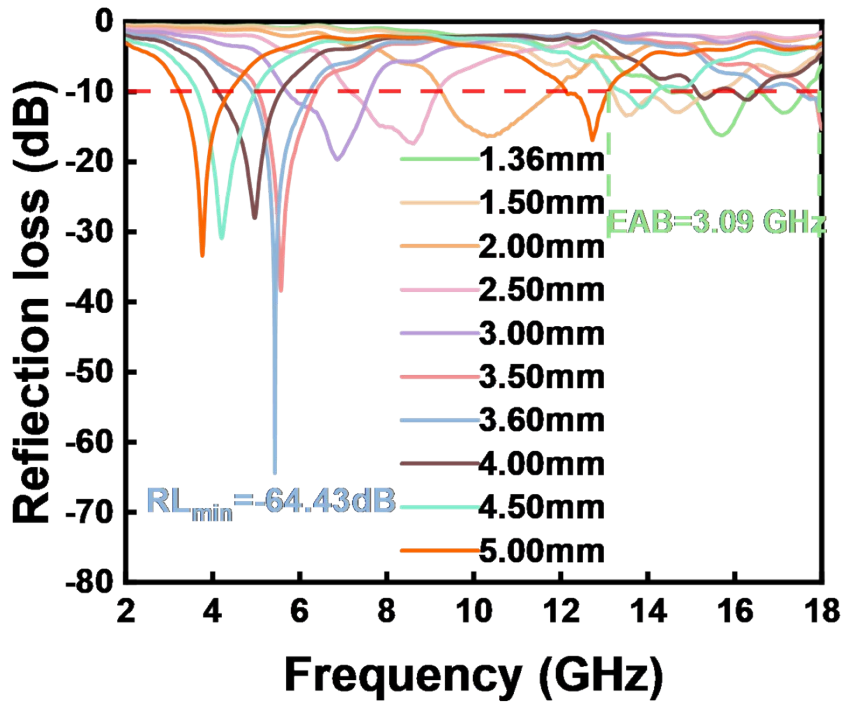

Figure S4 RL curves of SiO_2@Gr-OolyCo.

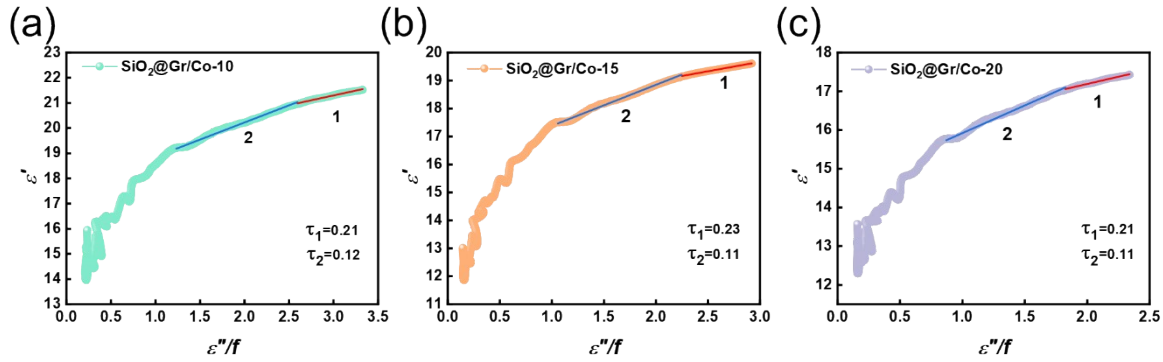

Figure S5 The relationship between ε' and ε''/f of (a) SiO_2@Gr/Co-10, (b) SiO_2@Gr/Co-15, and (c) SiO_2@Gr/Co-20.

Table S1 Comparison of EMW absorption performance with the recently reported EMW absorption materials of similar compositions.

Sample	Filling ratio (wt%)	Thickness (mm)	RLmin (dB)	Thickness (mm)	EAB (GHz)	Refs.
CoC@CoFe/C@PPy	25	1.69	-64.32	1.88	5.38	[1]
Co-2DSiO_2	30	2.5	-51.6	2.5	4.6	[2]
(ZrO_2-SiO_2)f/ZrB_2-SiOC	/	2.9	-59.34	2.9	4.2	[3]
Ti_3C_2Tx@C–Co@SiO_2	30	1.8	-51.8	1.4	3.9	[4]
Co-Fe@C/SiO_2	30	1.43	-59.6	1.43	4.6	[5]
CCM7	20	2.5	-61.42	2.5	4.1	[6]
CMC2	/	3.9	-39.6	1.4	3.76	[7]
Co@SiO_2@PPy	50	1.83	-50.70	1.83	5.4	[8]
FCNWs-3	/	4.9	-47.6	5.5	4.0	[9]
SiO_2@$Ti_3C_2T_x$	60	1.3	-58.01	1.3	3.44	[10]
PCN/SiO_2@MXene/Fe_3C	40	2.03	-71.14	2.03	3.85	[11]
SiO_2@Gr/Co-20	50	1.52	-73.12	1.34	4.02	This work

References

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