Supplementary Materials

Bioinspired porous Ti_2CT_X/Si_3N_4 composites with aligned lamellar structure for efficient microwave absorption

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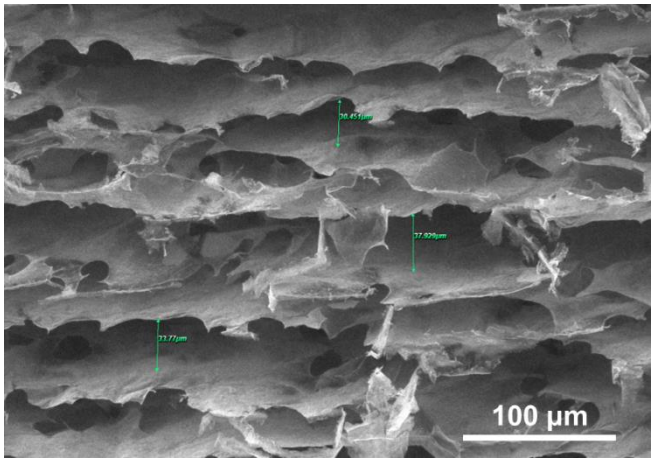

Figure S1. SEM image of Ti_2CT_X.

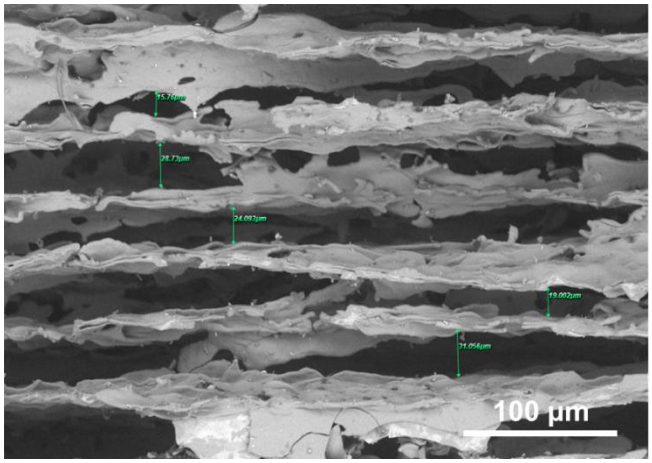

Figure S2. SEM image of Ti_2CT_X/Si_3N_4.

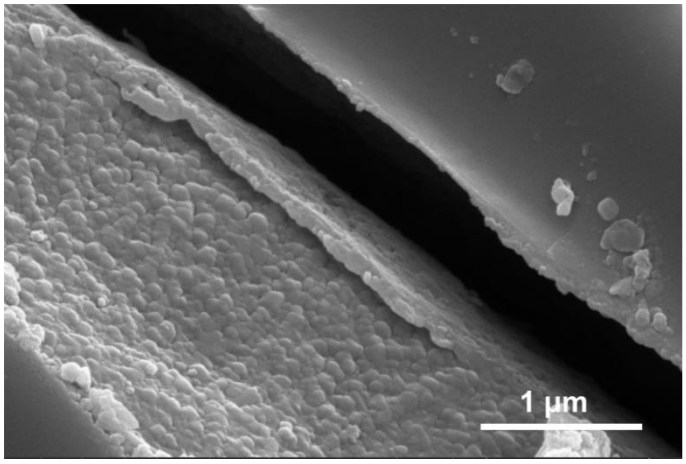

Figure S3. SEM image of Ti_2CT_X/Si_3N_4.

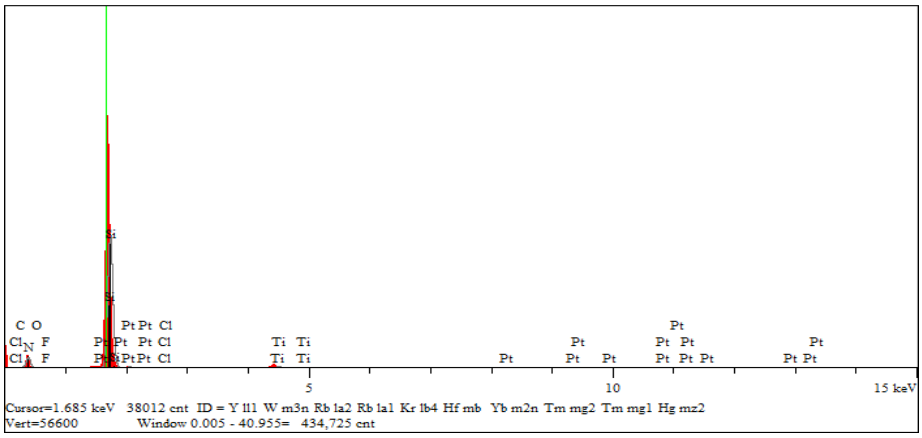

Figure S4. The EDS of Ti_2CT_X/Si_3N_4.

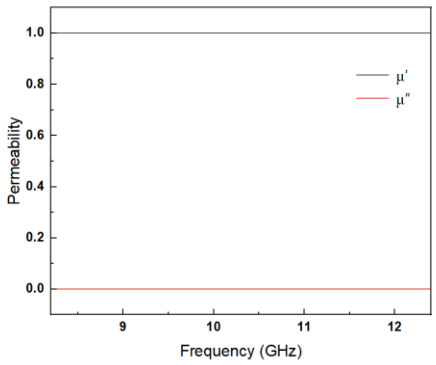

Figure S5. The μ' and $\mu''$of Ti_2CT_X/Si_3N_4.

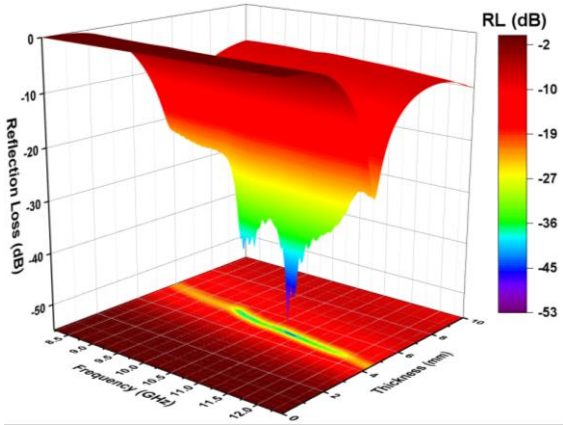

Figure S6. The three-dimensional RL values of bidirectional structure.

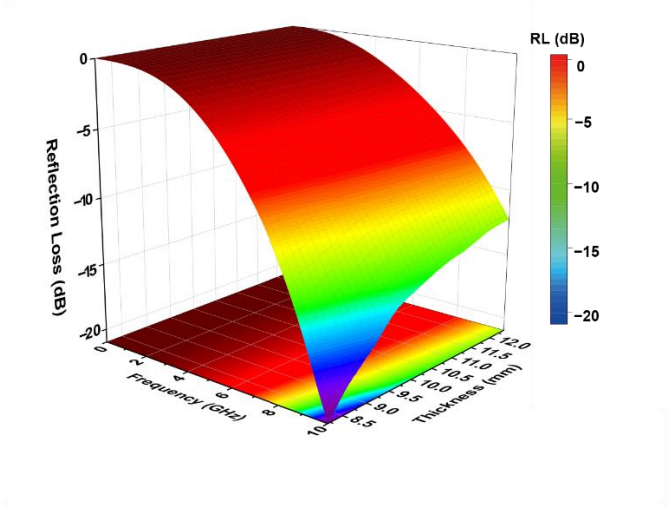

Figure S7. The three-dimensional RL values of unidirectional structure.

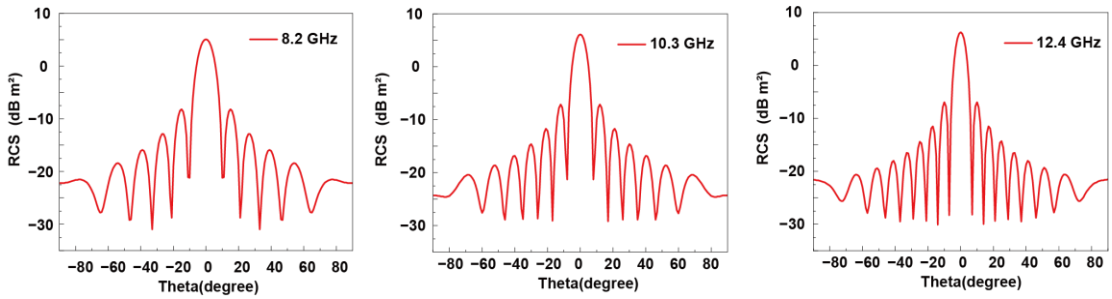

Figure S8. RCS values at different angles.

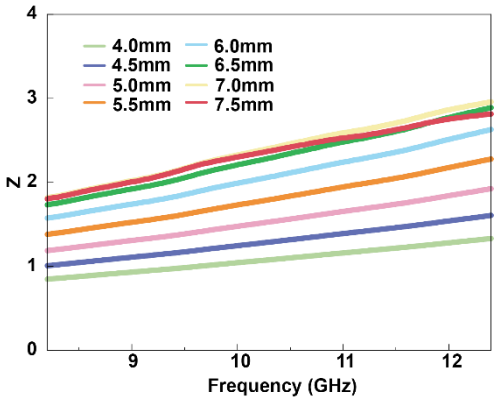

Figure S9. The Z of Ti_2CT_X/Si_3N_4 with unidirectional structure.

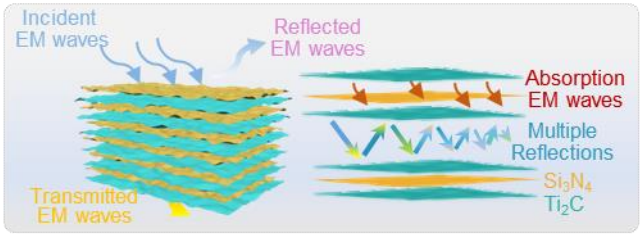

Figure S10. Schematic diagram of electromagnetic absorption mechanism of Ti_2CT_X/Si_3N_4.

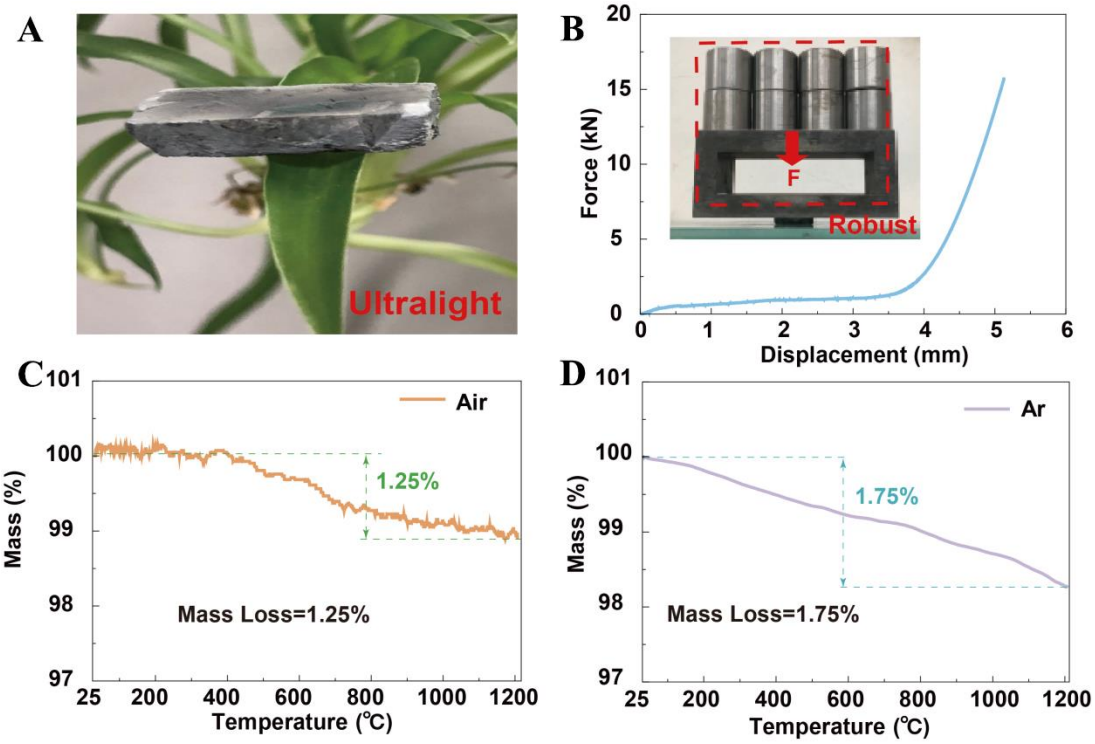

Figure S11. Mechanical properties and thermal stability of the Ti_2CT_X/Si_3N_4. (A) Ultra-lightweight properties of Ti_2CT_X/Si_3N_4; (B) Compressive strength curves of Ti_2CT_X/Si_3N_4; (C) TG of Ti_2CT_x/Si_3N_4 in an air atmosphere; and (D) TG of Ti_2CT_X/Si_3N_4 in an Ar atmosphere.

Table S1. Deposition parameters of $SiCl_4$-NH_3-H_2-Ar system

Q_{SiCl_4} (mL/min)	Q_{NH_3}	Q_{H_2}	Q_{Ar}
30	60	200	100

Table S2. The EDS of Ti_2CT_x/Si_3N_4

Elt.	Line	Intensity (c/s)	Conc	Units	Error 2-sig	MDL 3-sig	
C	Ka	12.38	3.235	wt.%	0.355	0.454	
N	Ka	155.22	31.908	wt.%	0.576	0.293	
O	Ka	5.96	0.902	wt.%	0.188	0.262	
F	Ka	1.24	0.098	wt.%	0.102	0.154	
Si	Ka	2,406.74	56.879	wt.%	0.249	0.061	
Cl	Ka	6.61	0.252	wt.%	0.051	0.072	
Ti	Ka	32.82	2.073	wt.%	0.111	0.123	
			100.000	wt.%			Total

Table S3. Dielectric parameters of the microwave transparent ceramics

Ceramic materials	ε_r
SiO_2	3.7-4.6
Si_3N_4	7.5
BN	3.0-5.0
Al_2O_3	8