

Multiscale hierarchical architecture of SiC whiskers-graphite nanosheets/polypyrrole ternary composite for enhanced electromagnetic wave absorption

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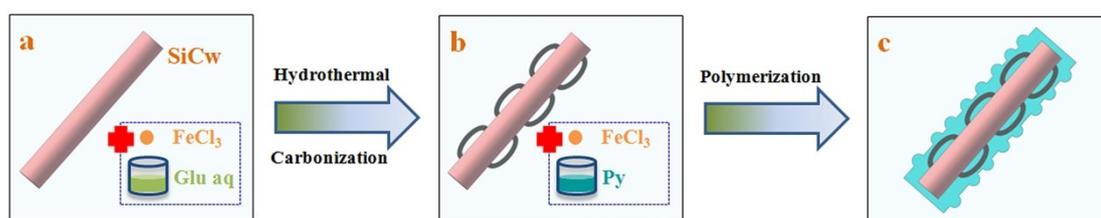


Fig. S1 Schematic illustration of the preparation processes of SiCw-GNs and SiCw-GNs/PPy heterostructures.

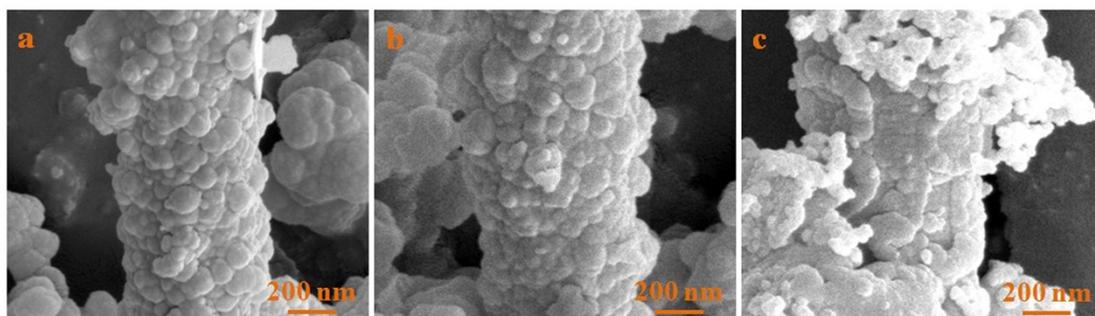


Fig. S2 A closer examination of the surface states of SiCw-GNs/PPy with the increase of immersing time. (a) 0.5h, (b) 1.0 h and (c) 1.5 h.

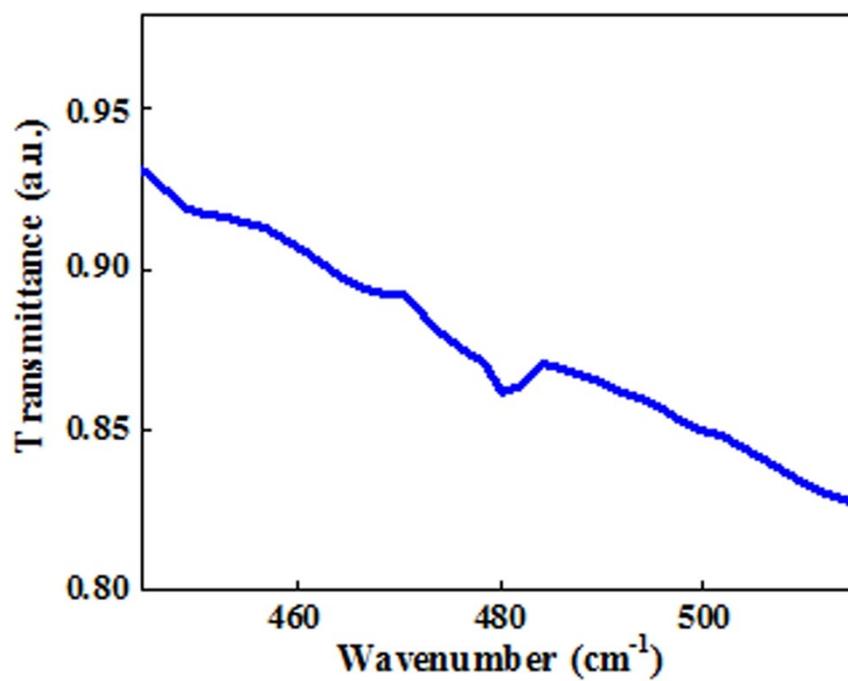


Fig. S3 A closer examination of FT-TR spectrum of S-5-0.5 located at 450-520 cm⁻¹ wavelength.

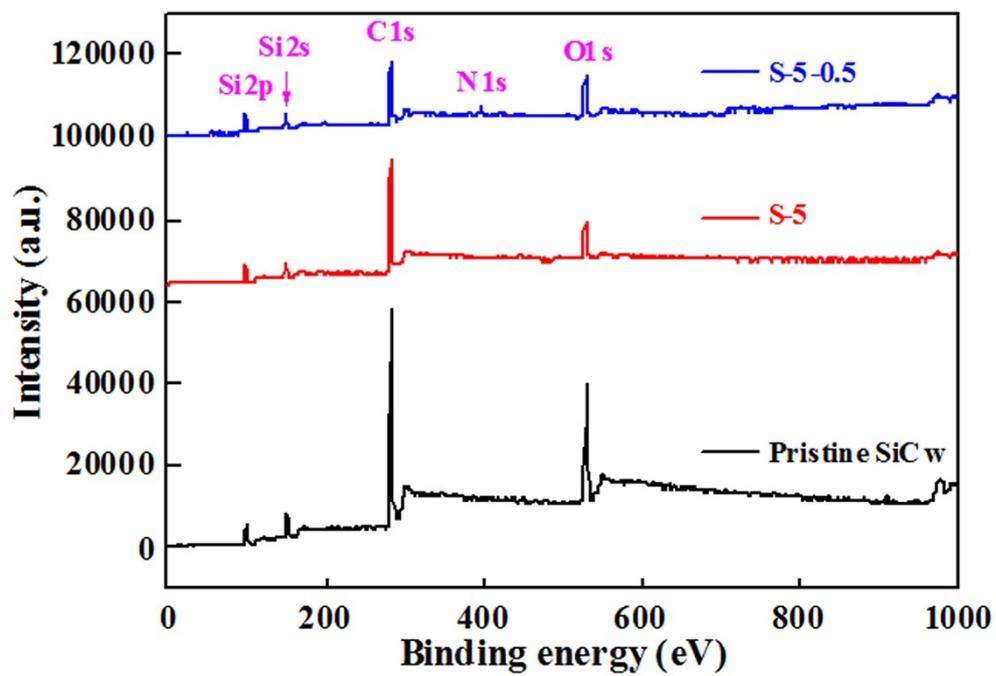


Fig. S4 Survey spectra of pristine SiCw, SiCw-GNs and SiCw-GNs/PPy heterostructures.

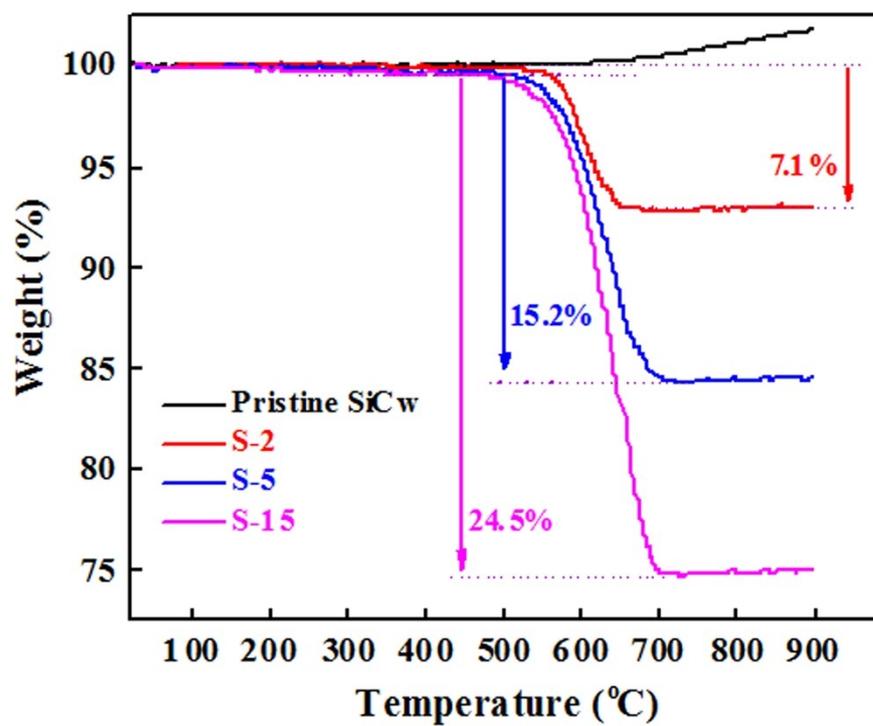


Fig. S5 TG curves of pristine SiCw and SiCw-GNs heterostructures with different mass ratios of glucose (2, 5 and 15 wt.% labeled as S-2, S-5 and S-15).

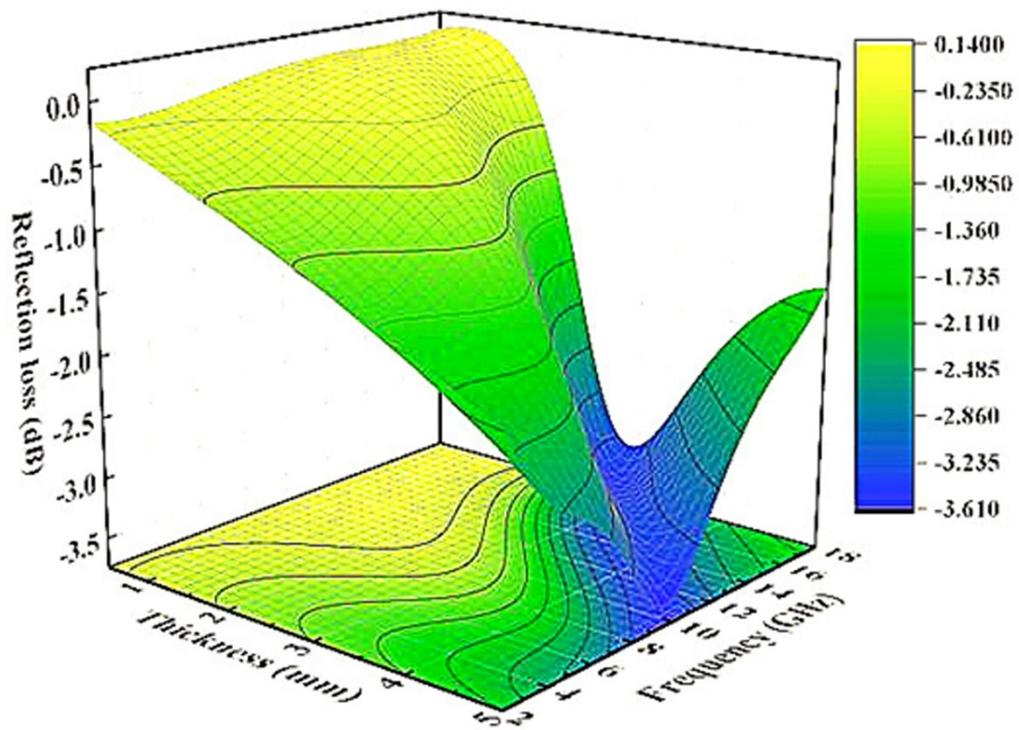


Fig. S6 The three-dimensional presentation of RL of pristine SiCw.

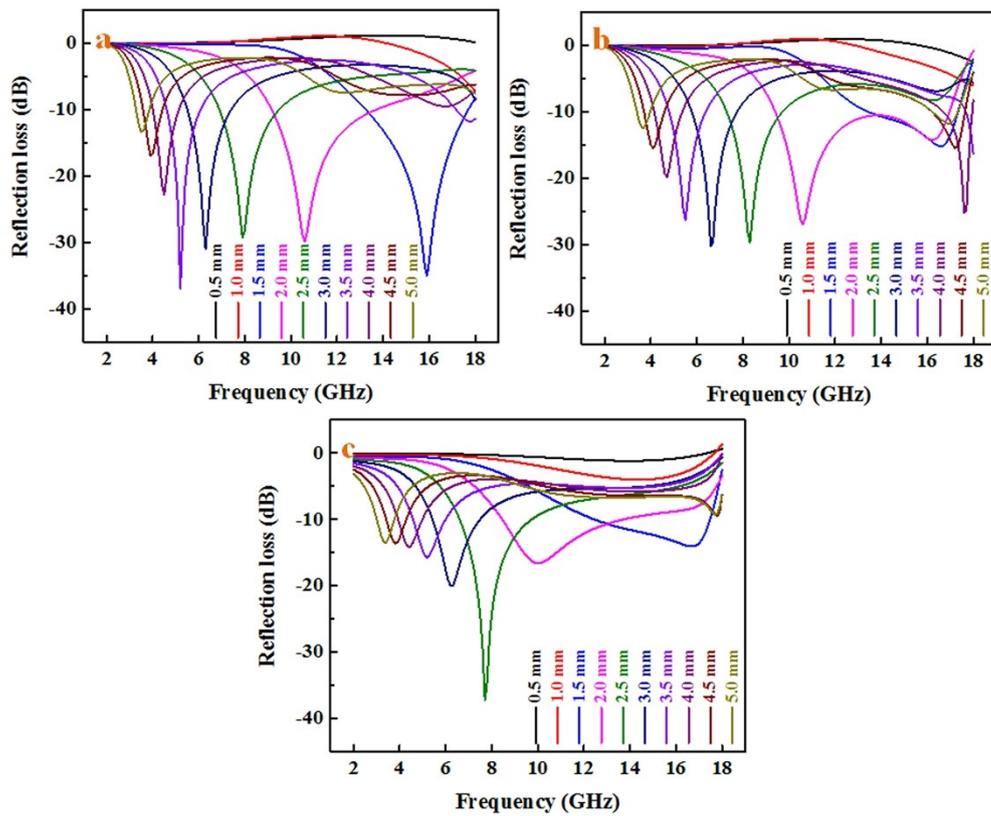


Fig. S7 The theoretical curves of EM wave RL curves of SiCw-GNs/PPy composites with polymerization times (a) 0.5 h, (b) 1.0 h and (c) 1.5 h (S-2-0.5, S-2-1.0 and S-2-1.5), respectively.

Table S1 Comparison of EM wave absorption performance of different EM absorbers in recent literatures.

Absorber	Minimal RL value (dB)	Absorption bandwidth		Ref
		RL \leq -10 dB (GHz)	Optimum thickness (mm)	
PPy microparticles	-15.1	5.48 (12.52-18)	2.0	48
3D PPy aerogel	-35	6.2 (10.72-16.92)	2.5	49
PPy-SiCNWs	-20	6.52 (10.52-17.04)	2.5	31
Fe ₃ O ₄ -SiCNWs	-51	4.1	3.0	16
Co-SiCNWs	-25	6.6 (10-16.6)	2.1-2.5	50
Fe-SiC fibers	-46.3	5.6 (4-9.6)	2.25	15
Fe-doping SiCw	-21.2	2.6 (9.8-12.4)	2.0	21
ZnO-SiCNWs	-42.1	4.48	3.5	22
SiCNWs	-31.7	2.5	2.0	51
C-SiCNWs	-27.8	4.7	1.7	52
S-5	-7.62	-	-	
S-15	-6.88	-	-	
Pristine S-2	-10.8	1.5 (16.5-18.0)	2.54	This work
S-2-0.5PPy	-54.4	5.2 (9.9-15.1)	1.89	
S-2-1.0PPy	-64.2	7.6 (9.3-16.9)	2.02	
S-2-1.5PPy	-58.6	7.9 (9.7-17.6)	1.8	