Electronic Supplementary Material (ESI) for Materials Chemistry Frontiers.

Supporting Information

Multi-nanocomponent-assembled films with exceptional capacitance performance and electromagnetic interference shielding

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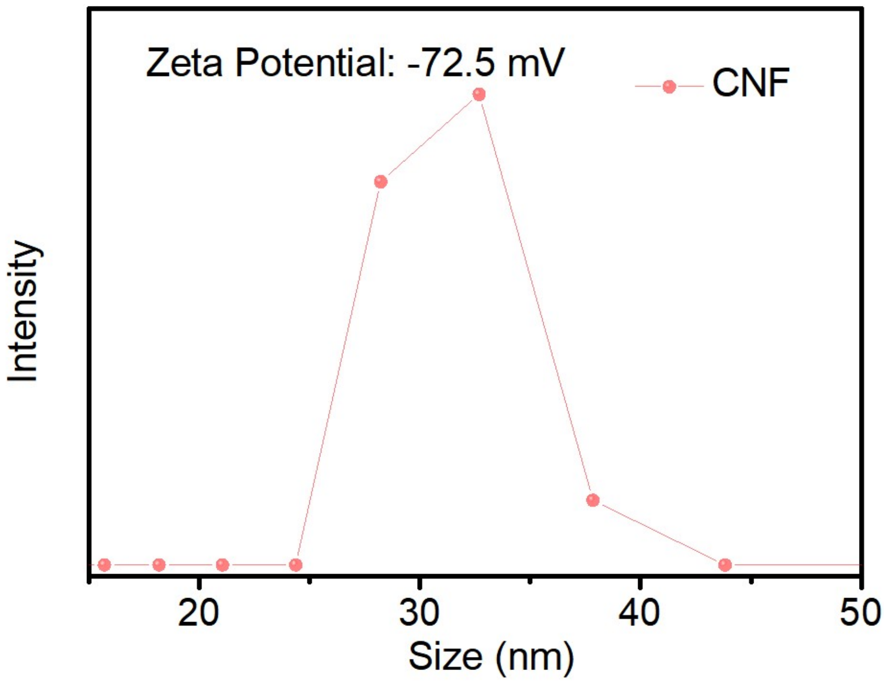

Figure S1. Zeta potential of a CNF dispersion

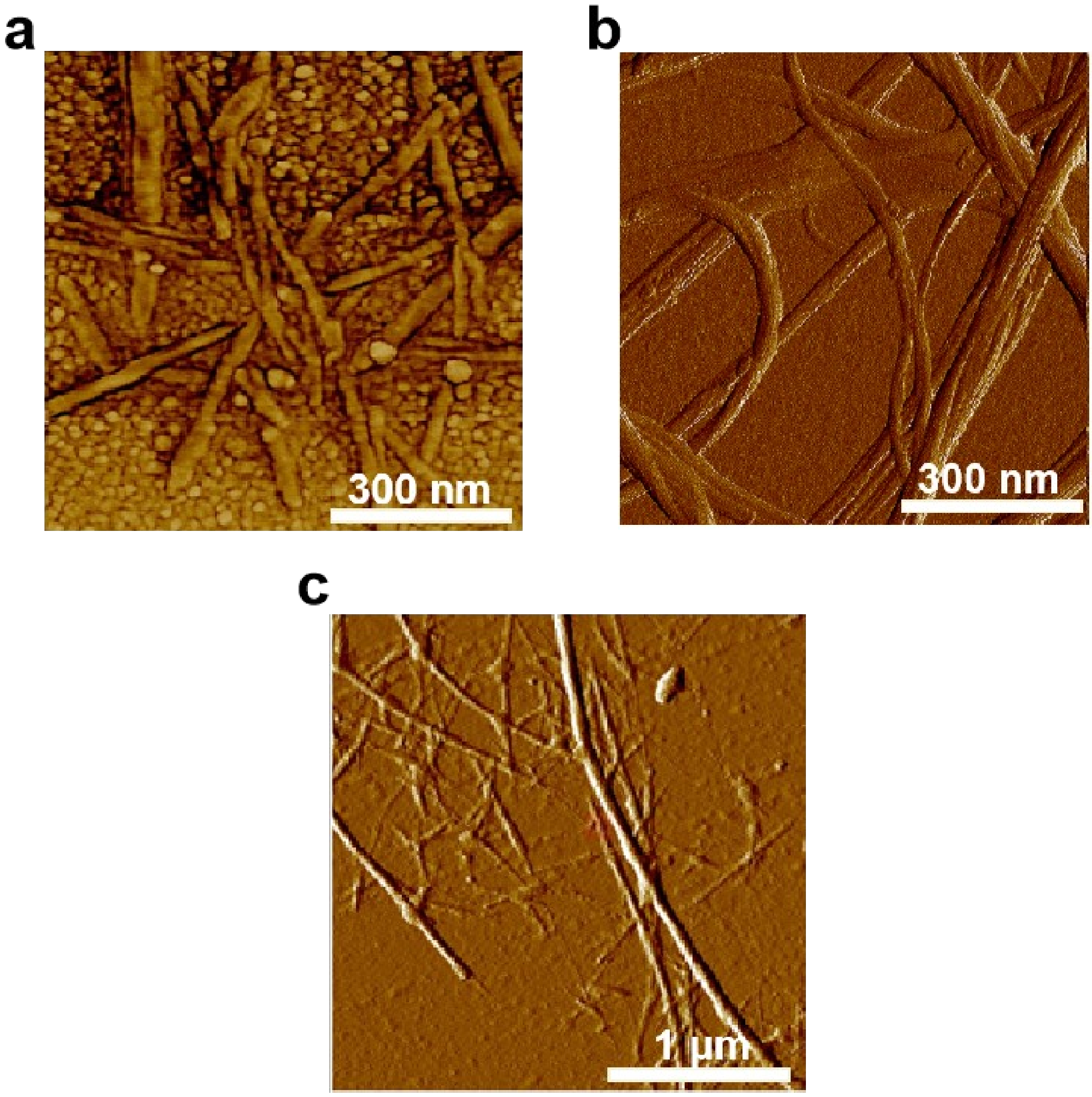

Figure S2. (a-c) AFM image of CNFs, SWCNTs and CNF@CNT, respectively.

Figure S3. The Digital photographs of CNF@CNT@RGO films were soaked in water for 48 hours and dried again under 60 ℃

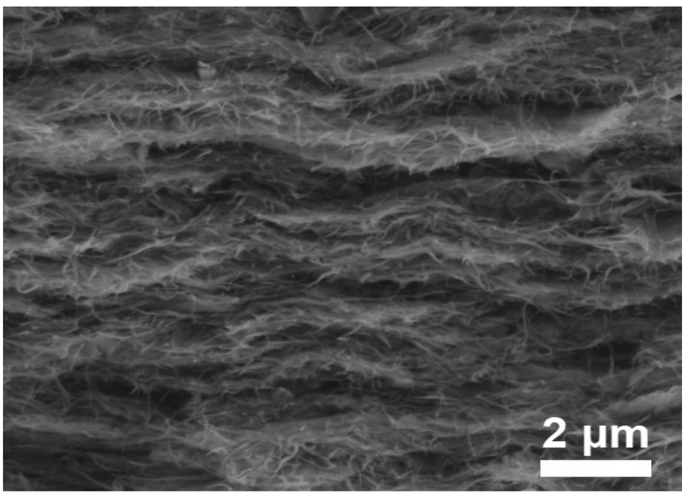

Figure S4. The side views of SEM images of CNF@CNT@RGO films.

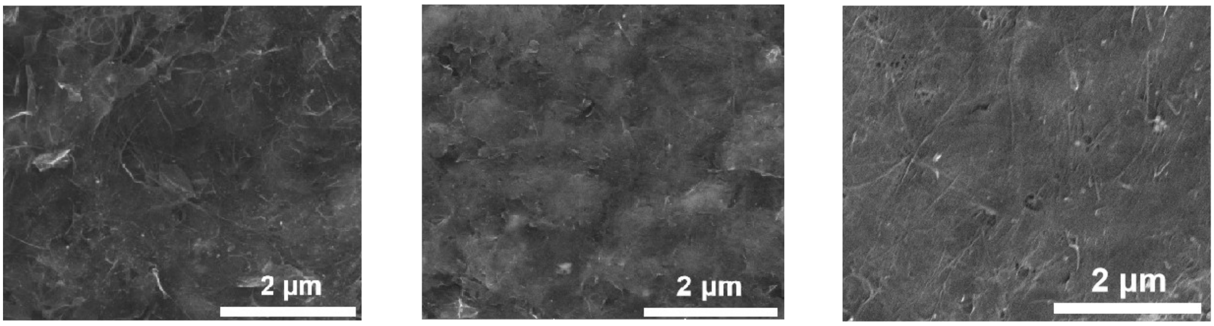

Figure S5. (a-c) Top views of SEM images of 10 μm,50μm and 125 μm, respectively

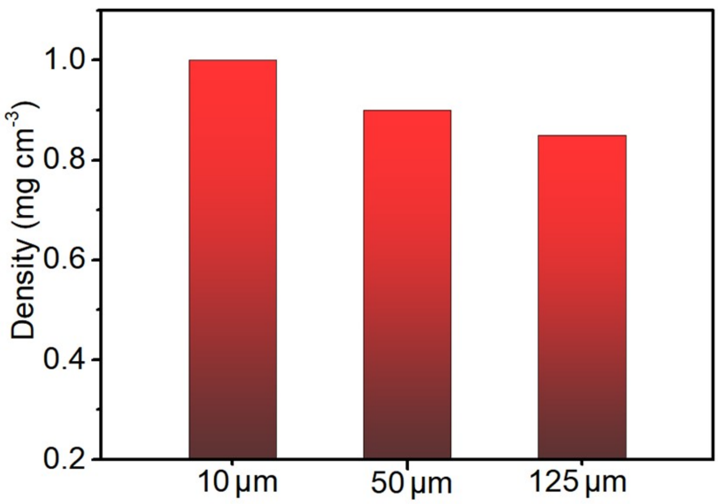

Figure S6. The density of 10 μm, 50 μm and 125 μm.

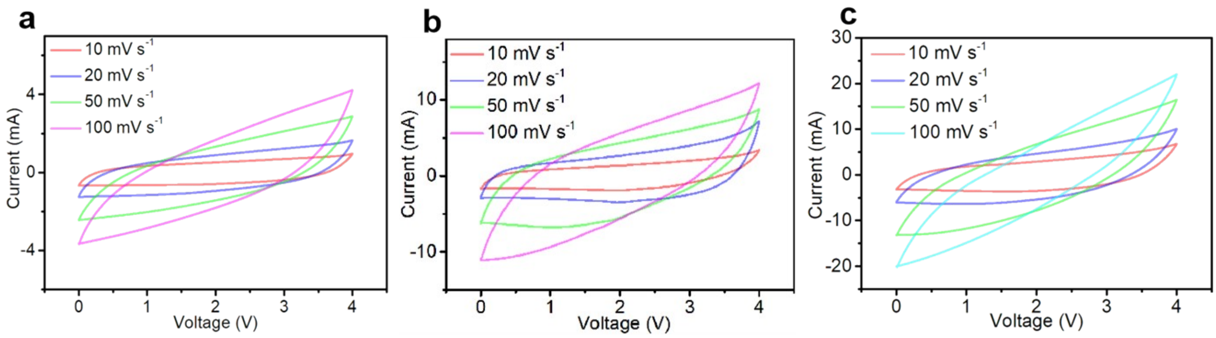

Figure S7. a-c)The CV curve at different scan rates of 10 µm, 50 µm and 125 µm, respectively.

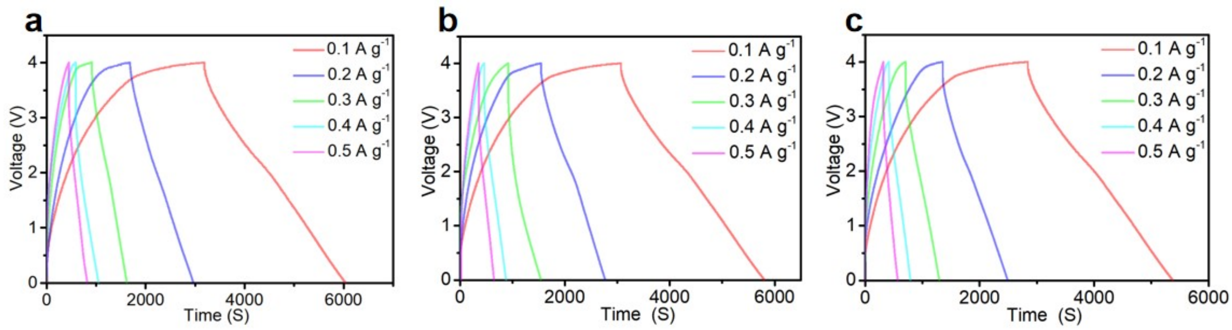

Figure S8. a-c)The GCD curve at different current density of 10 µm, 50 µm and 125 µm, respectively.

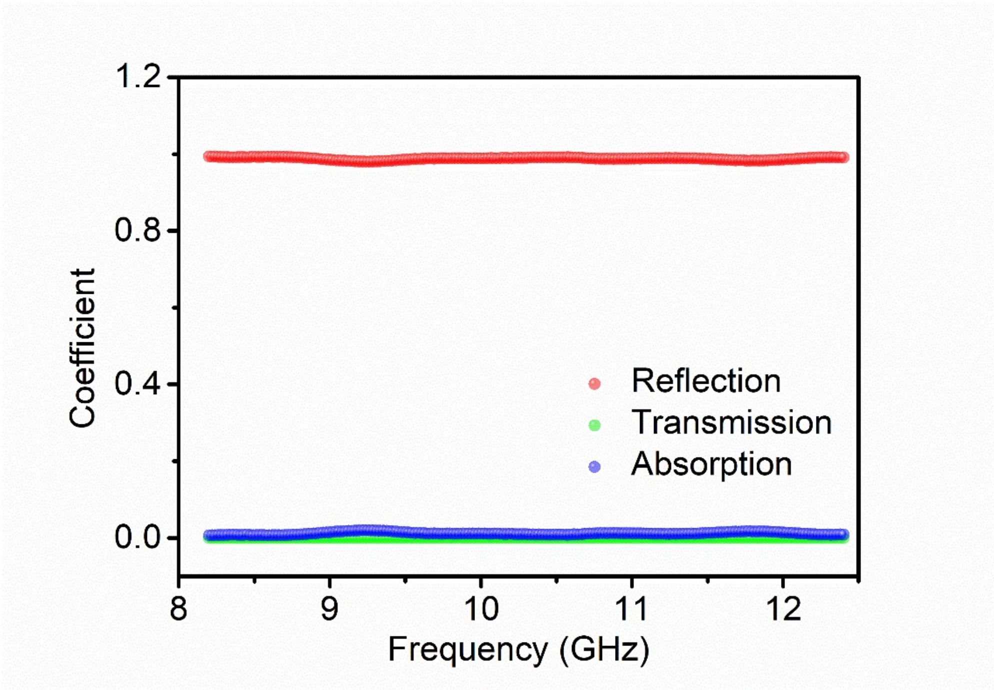

Figure S9. Reflection, absorption, and transmission coefficients of CNF@CNT@RGO in the X-band.

Table S1. Conductivity of films of different thickness

Samples	Conductivity ($S\ cm^{-1}$)
10 µm	462.9
50 µm	307.7
125 µm	222.2

Table S2. Comparison of EMI shielding performances for various carbon based materials

Type	Material	Thickness (mm)	Frequency Ranges (GHz)	EMI SE (dB)	Ref
Reduced Graphene Oxide	RGO/CNC	0.012	8.2-12.5	39.1	1
	RGO-Fe_2O_3-PVA	0.36	8.2-12.5	20.3	2
	RGO-Fe_2O_3-PEI	2.5	8.2-12.5	18.2	3
	RGO/CNF	0.023	8.2-12.5	26.2	4
	RGO/EG	0.043	8.2-12.5	48.3	5
	RGO/WPU	1	8.2-12.5	48.1	6
	RGO@Fe_3O_4/EP	1	8.2-12.5	13.45	7
	RGO/MXene	3	8.2-12.5	50.7	8
	RGO/PDMS	2	8.2-12.5	54.2	9
	RGO	0.0084	8.2-12.5	20	10
	G-foam	0.3	8.2-12.5	42.3	11
	LC/RGO	2	8.2-12.5	70.5	12
	PI/RGO/MWCNTs	0.5	8.2-12.5	18.2	13
	RGO/PI	0.5	8-12	14.9	14
	Fe_3O_4/TAGA/epoxy	3	8.2-12.5	35	15
	sRGO/PS	2.5	8.2-12.5	45.1	16
	RGO-Fe_2O_3/PANI	2.5	8.2-12.5	51	17
	RGO-CNT/PDMS	2	8.2-12.5	31	18
	GCFs	0.012	8-12	57	19
	TGAs	2.5	8.2-12.5	43.29	20
	RGO/LDC	2	8.2-12.5	49.2	21
	SRGO	4	8-40	70.2	22
	CNTs/RGO	3.1	8.2-12.5	49	23
	CCA@RGO/PDMS	3	8.2-12.5	51	24
Graphene Oxide	GO-EG-Fe_2O_3-PI	0.085	8.2-12.5	34	25
	Ag NWs/GO	0.008	8.2-12.5	62	26
High-quality Graphene	fGnP90@PANF	0.021	8.2-12.5	48.2	27
	PG/PI	0.025	8.2-12.5	60.2	28
	Fe_3O_4/GN	0.25	8.2-12.5	24	29
	3DGMTs	1.5	8.2-12.5	38	30
	PI/graphene	2.5	8.2-12.5	28.8	31
	HPG	0.0483	8.2-12.5	61.8	32

	Ni@G-P	0.7	8.2-12.5	51.4	33
	GNPs	0.18	8.2-12.5	58.1	34
	D-LIG/Ni	0.327	8.2-12.5	79	35
	CNF@CNT@RGO	**0.125**	**8.2-12.5**	**75**	**This work**

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