Supplementary Materials

EMI Shielding Nanocomposite Laminates with High Temperature Resistance, Hydrophobicity and Anticorrosion Properties

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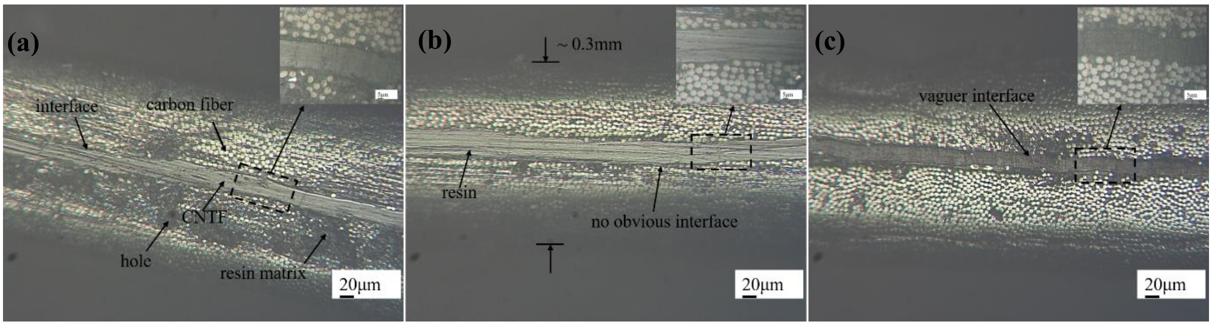

Figure S1. Microscope images of (**a**) sample 1, (**b**) sample 2, (**c**) sample 4 heated by oven, hot press and CNTF e-heating, respectively.

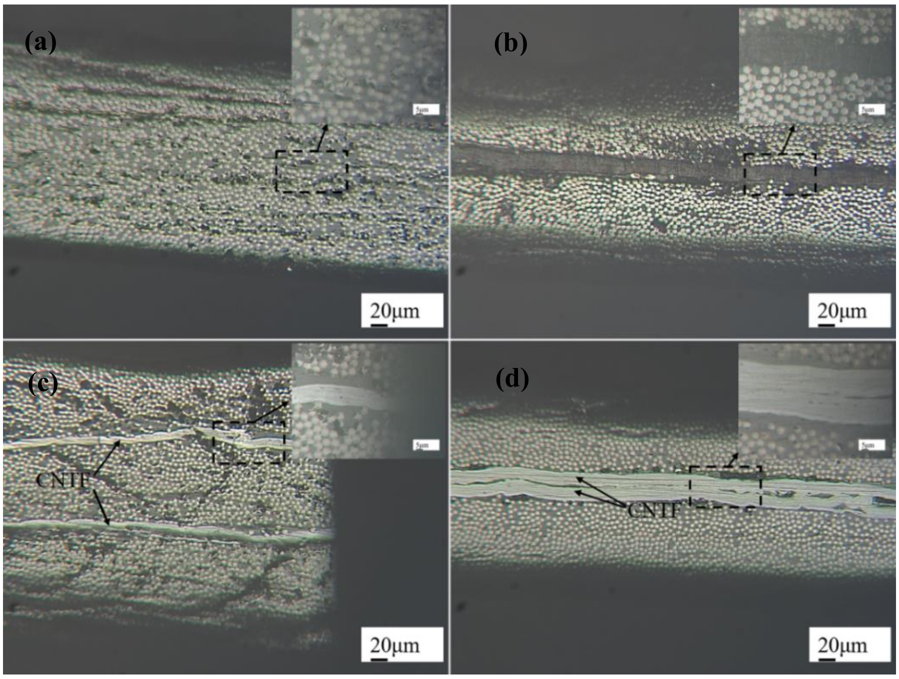

Figure S2. Microscope images of (**a**) sample 3, (**b**) sample 4, (**c**) sample 5 and (**d**) sample 7.

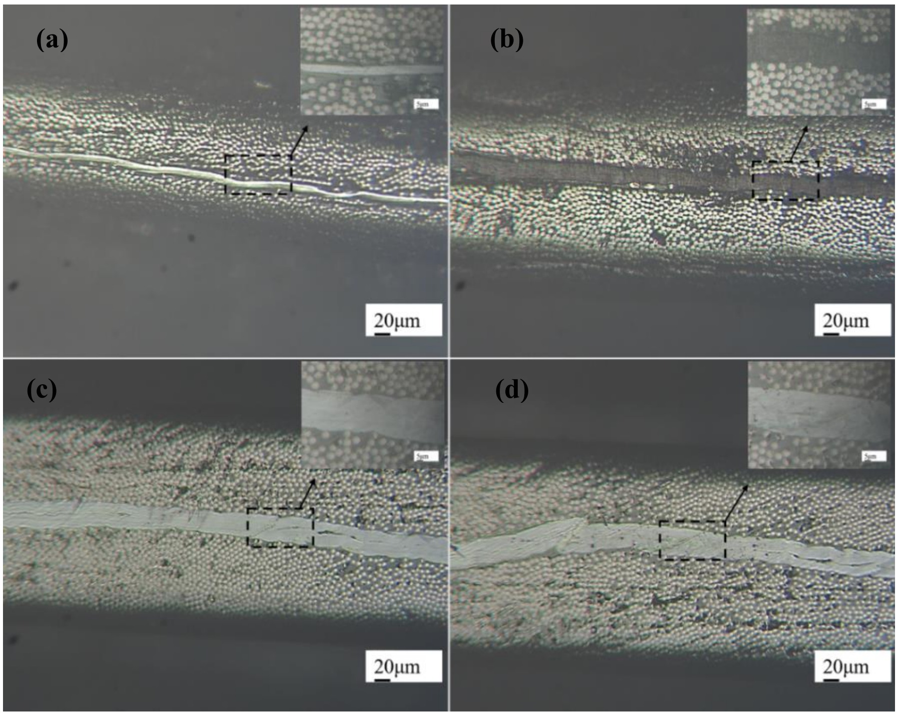

Figure S3. Microscope images of (**a**) sample 9, (**b**) sample 4, (**c**) sample 8 and (**d**) sample 10.

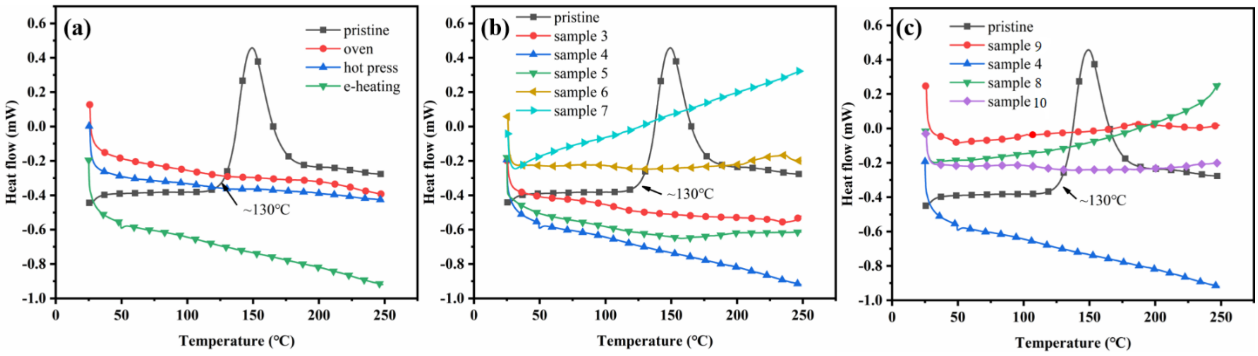

Figure S4. DSC curves of (**a**) uncured pristine prepreg and sample 1, 2, 4 (oven, hot press and e-heating, respectively), (**b**) uncured pristine prepreg and sample 3-7 (**c**) uncured pristine prepreg and sample 9, 4, 8, 10.

Table S1. Curing degree of the sample 1-10.

Samples	1 (oven)	2 (hot press)	4 (e-heating)	3	5
Curing degree	99.9%	99.5%	99.8%	99.9%	99.9%
Samples	6	7	8	9	10
Curing degree	99.8%	99.2%	99.8%	99.9%	99.6%

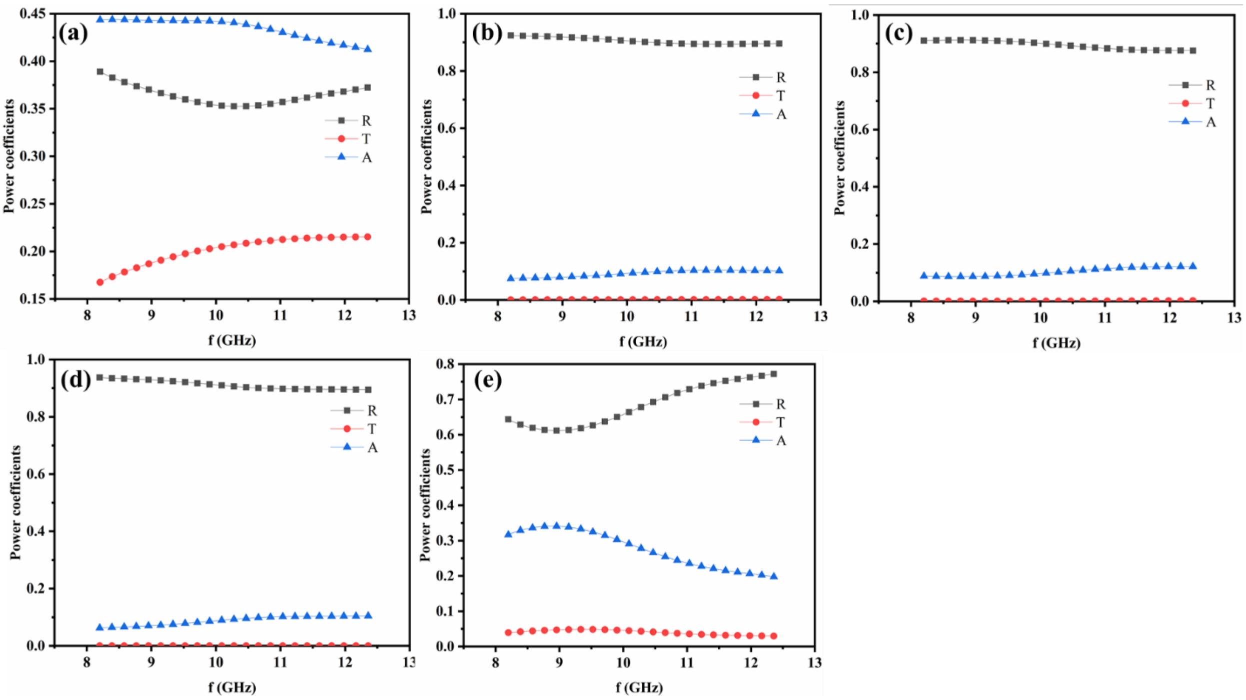

Figure S5. Power coefficients R, T, A of (**a**) sample 3, (**b**) sample 4 and (**c**) sample 5 (**d**) sample 6, (**e**) sample 7.

Table S2. Parameters of CNTF in composite prepreg.

sample	9	4	8	10
areal density (g/m^2)	5.48	6.8	12.5	24.8
t (μm)	18.7	23.37	34	60
R (Ω/□)	2.46	0.88	0.55	0.3
σ (S/m)	2.2×10^4	4.9×10^4	5.3×10^4	5.6×10^4

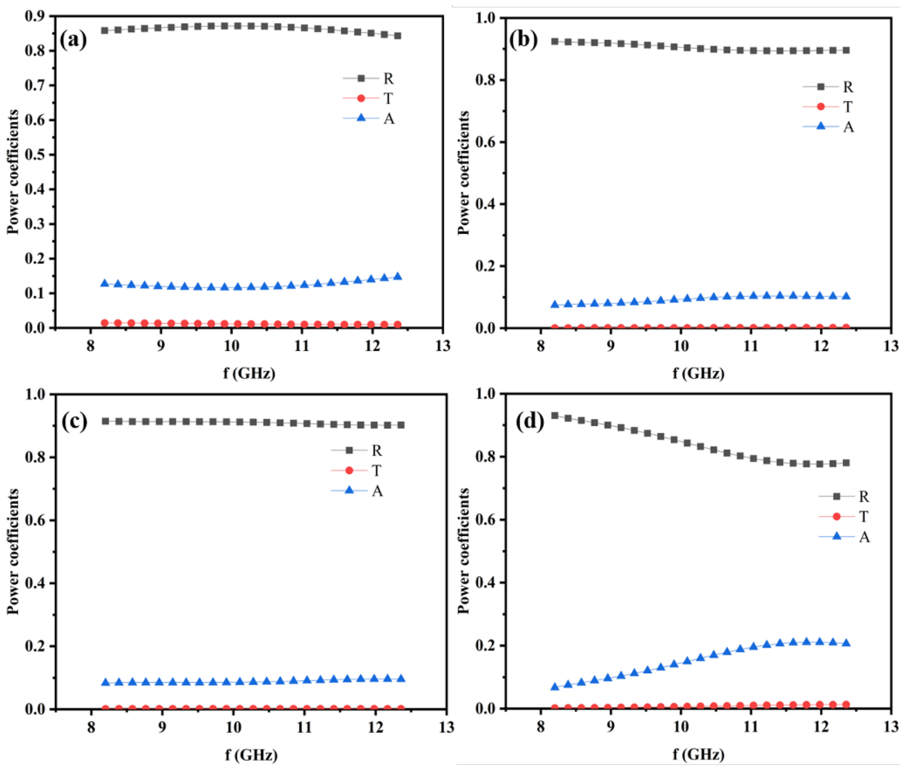

Figure S6. Power coefficients R, T, A of (**a**) sample 9, (**b**) sample 4, (**c**) sample 8 (**d**) sample 10.

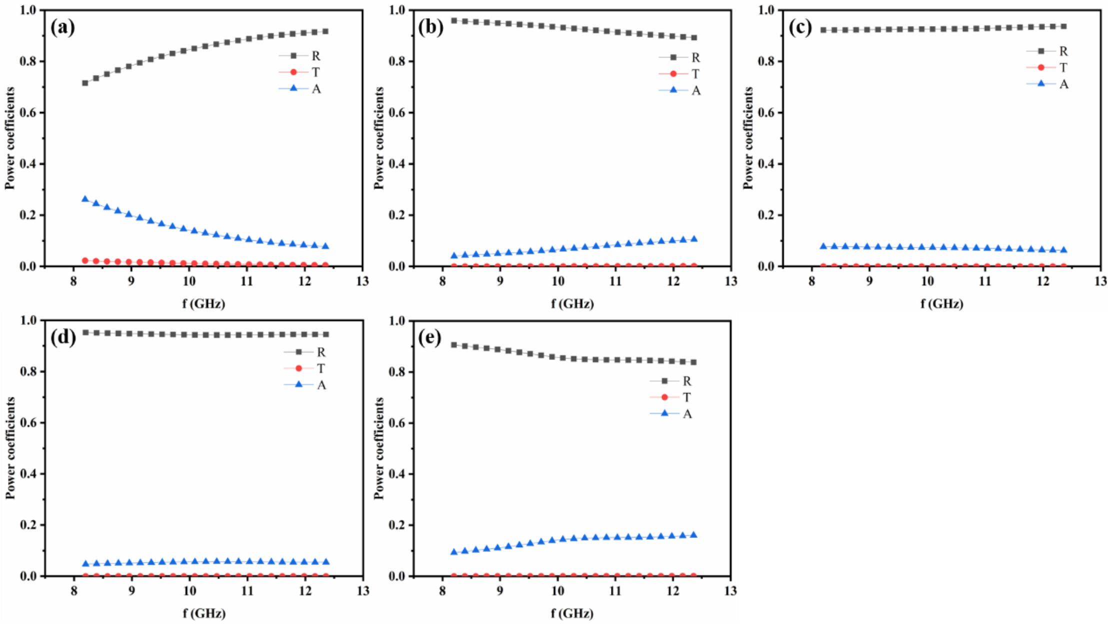

Figure S7. Power coefficients R, T, A of (**a**) sample 11, (**b**) sample 12, (**c**) sample 13, (**d**) sample 14 and (**e**) sample 15.

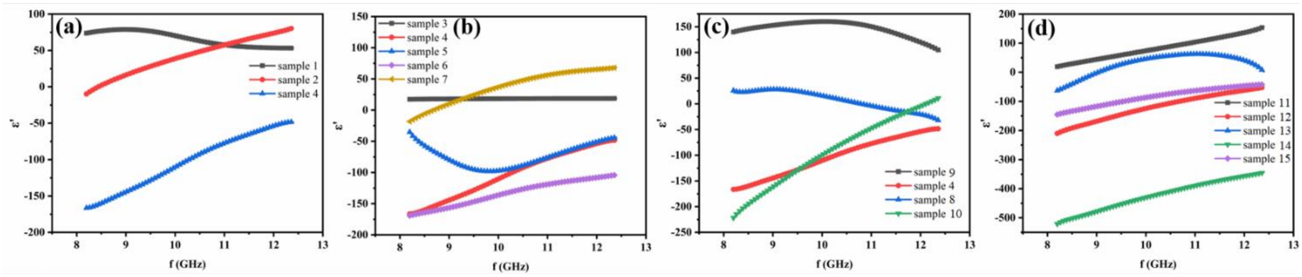

Figure S8. Real part of permittivity ε' of (**a**) samples 1, 2, 4, (**b**) samples 3-7, (**c**) samples 9, 4, 8, 10 with gradually enhanced areal density of CNTF, (**d**) samples 11-15.

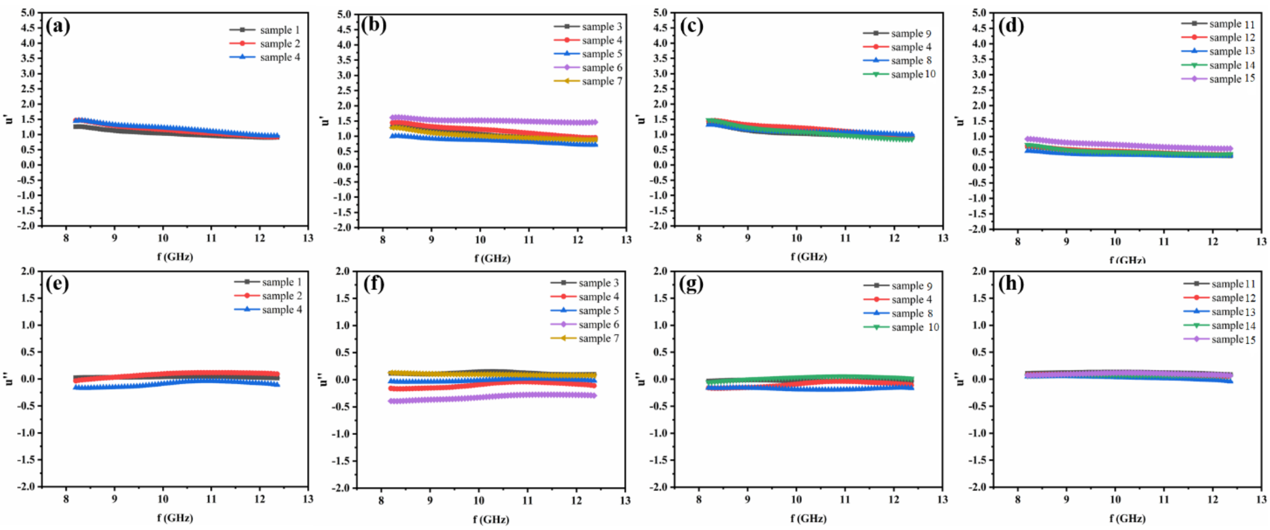

Figure S9. Real part of permeability μ' of (**a**) samples 1, 2, 4, (**b**) samples 3-7, (**c**) samples 9, 4, 8, 10, (**d**) samples 11-15; imaginary part μ'' of (**e**) samples 1, 2, 4, (**f**) samples 3-7, (**g**) samples 9, 4, 8, 10, (**h**) samples 11-15.

Table S3. Comparison of EMI shielding performance of different composites.

Type	Filler	Matrix*	Thickness (mm)	SSE(dB/μm)	References
CNT	MWCNT	PP	1	0.035	[1]
	MWCNT	CPE	1	0.036	[2]
	MWCNT	CPE	5	0.0044	[3]
	MWCNT	PLLA	1.3	0.0346	[4]
	MWCNT	iPP	1.3	0.04	[4]
	MWCNT	PLLA/PCL	1.5	0.0113	[5]
	SWCNT (High aspect ratio)	Epoxy	1.5	0.0327	[6]
	CNT (Long length)	Epoxy	2.5	0.0064	[7]
	SWCNT	Epoxy	1	0.02	[8]
	SWCNT	PS	1.2	0.0154	[9]
	MWCNT	WPU	1	0.0211	[10]
	MWCNT	PS	2	0.015	[11]
	MWCNT	PC	2.1	0.0186	[12]
	MWCNT	ABS	1.1	0.0455	[13]
	MWCNT	PA	1.5	0.0167	[14]
	MWCNT	SEBS	2	0.01535	[15]
	MWCNT	PU	2	0.0206	[16]
	MWCNT	PU	2	0.008	[17]
	MWCNT	PS	2	0.0086	[18]
	MWCNT	PE	2	0.0015	[19]
	MWCNT	PTT	2	0.0019	[20]
	MWCNT	PS	1	0.02	[21]
	MWCNT	TPU	2	0.01765	[22]
	MWCNT	PS	0.3	0.0567	[23]
	MWCNT	PVDF	2	0.0184	[24]
	MWCNT	WPU	0.4	0.06175	[25]
	MWCNT	PC	0.9	0.0078	[26]
	MWCNT	PVDF	0.9	0.0089	[27]
	MWCNT	PVDF/PC	5	0.0032	[27]
	MWCNT	PVDF/ABS	5	0.0046	[28]
	MWCNT	TPU	0.8	0.0466	[29]
CNF	CNF	EMA	2.5	0.0116	[30]
	CNF	ABS	1.1	0.0237	[31]
	CNF	PI	1	0.013	[32]
	CNF	CPE	1	0.024	[33]
	VGCNF	PS	1	0.008	[34]
	CB/CNF	CPE	1	0.0329	[35]
	VGCNF	LCP	1.45	0.0076	[36]
	CNF	PS	1	0.0129	[37]
CB	CB	ABS	1.1	0.0018	[13]
	CB	CPE	1	0.0212	[38]
	CB	SEBS	5	0.00352	[39]
	CB	Epoxy	1	0.044	[40]
Graphene	RGO	PI	0.8	0.02625	[41]
	RGO	PEI	2.3	0.01	[42]
	IRGO	EMA	5	0.007	[43]
	RGO	PS	2.5	0.0116	[44]
	RGO	PS	2.5	0.01804	[45]
	CVD graphene	PDMS	3	0.012	Z[46]
	Graphene	PMMA	2.5	0.0076	Z[47]
	Functionalized graphene	PS	2.5	0.0116	[48]
	graphene	PU	2	0.016	[49]
	rGO	MWCNT	2.4	0.015	[50]

	Multilayer graphene	PVA	2	0.0195	[51]
	RGO	Epoxy	2	0.0105	[52]
	RGO	PS	2.8	0.0064	[53]

* PP- Polypropylene, CPE- Chlorinated polyethylene, PLLA- Poly(l-lactide), PCL-Poly(e-caprolactone, iPP- Isotactic polypropylene, TPU- Thermoplastic polyurethane, PS-Polystyrene, PU- polyurethane, BR- Butyl rubber, EVA- Ethylene vinyl acetate, PMMA-Polymethylmethacrylate, WPU- Waterborne polyurethane, PC-Polycarbonate, ABS- Acrylonitrile butadiene, PA- Polyamides, SEBS- Styrene-ethylene butylene styrene, PE- Polyethylene, PTT- Poly (trimethylene terephthalate), CPE- Chlorinated polyethylene, PVDF-Polyvinylidene fluoride, LCP-liquid crystal polymer. PDMS- polydimethylsiloxane, EMA- Ethylene methacrylate, PI- Polyimide, PEI- Polyethylenimine, PVA-Poly (vinyl alcohol), RGO-Reduced graphene oxide, IRGO- *insitu* reduced graphene oxide

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