Largely Enhanced Thermal Conductivity and Thermal Stability of UPE Composites via BN/CNT Synergy

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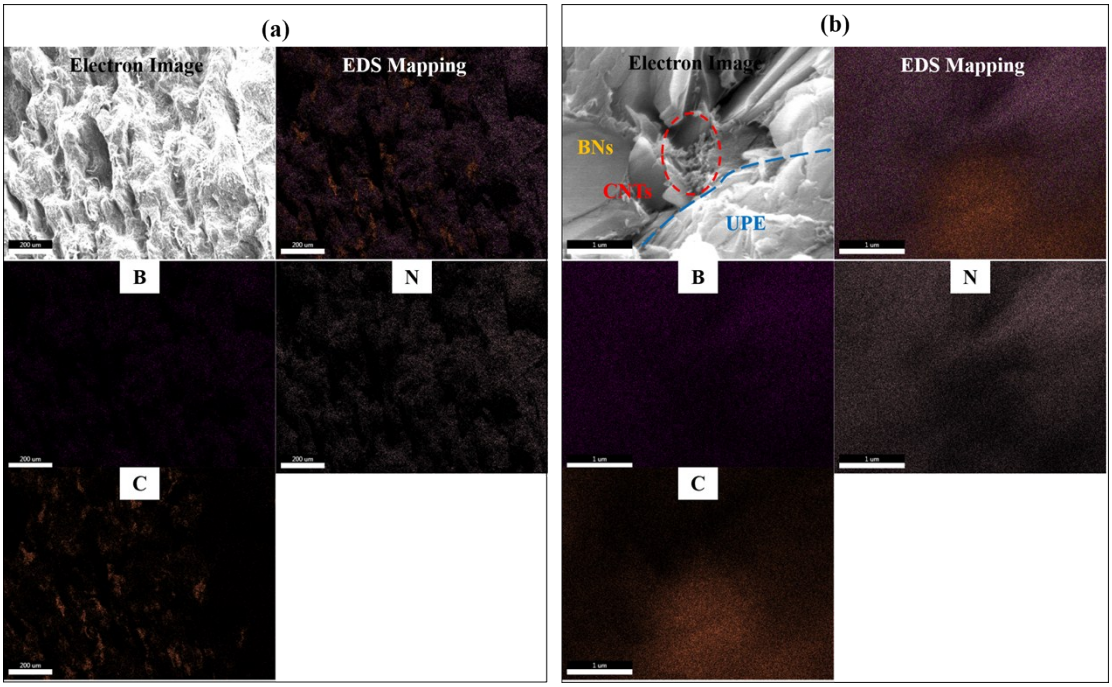

Figure S1. The EDS mapping images of (a) UPE/40BN and (b) UPE/40BN/7CNT composite.

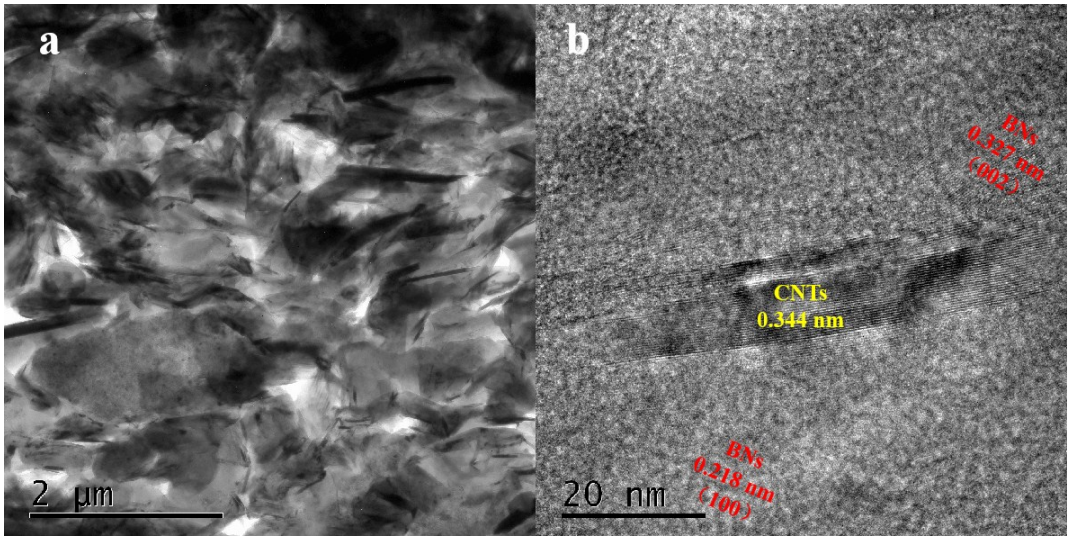

Figure S2. The TEM images of the UPE/40BN/7CNT composite with different scales.

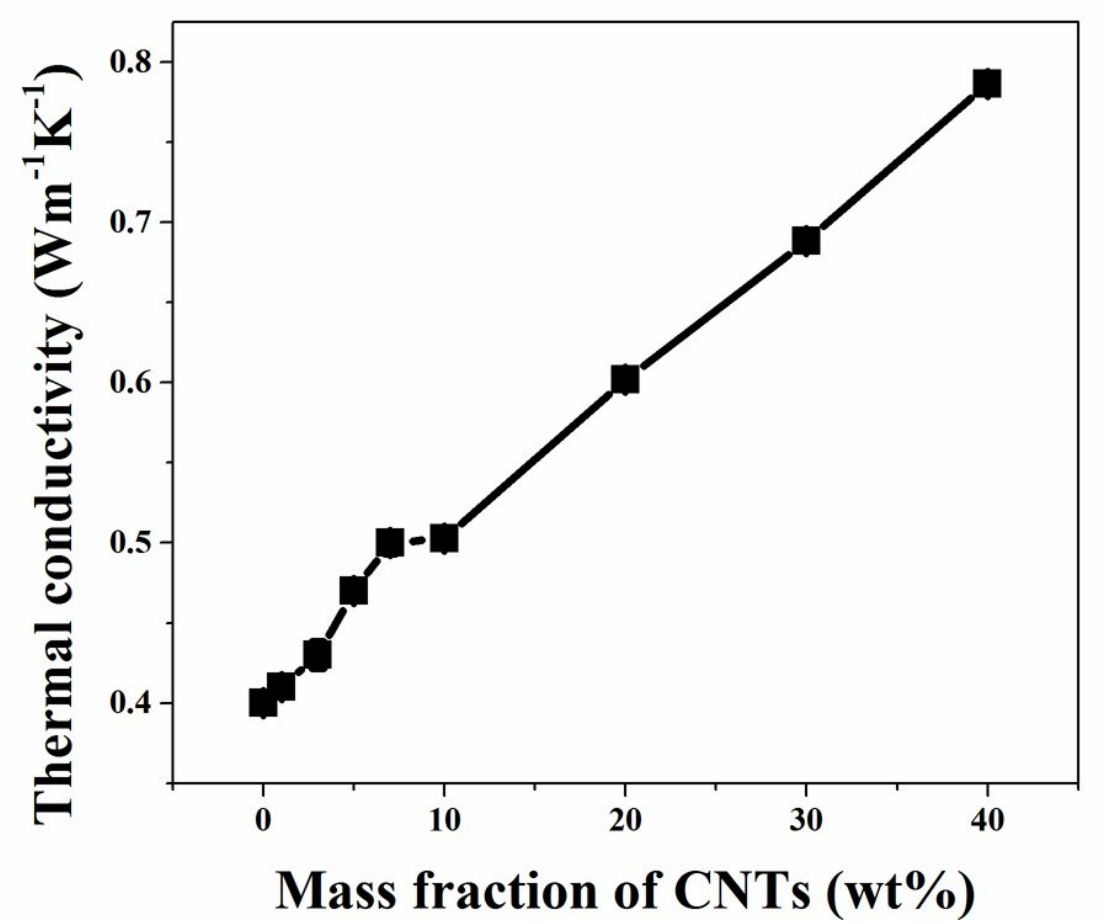

Figure S3. Thermal conductivity of the UPE/CNT composites.

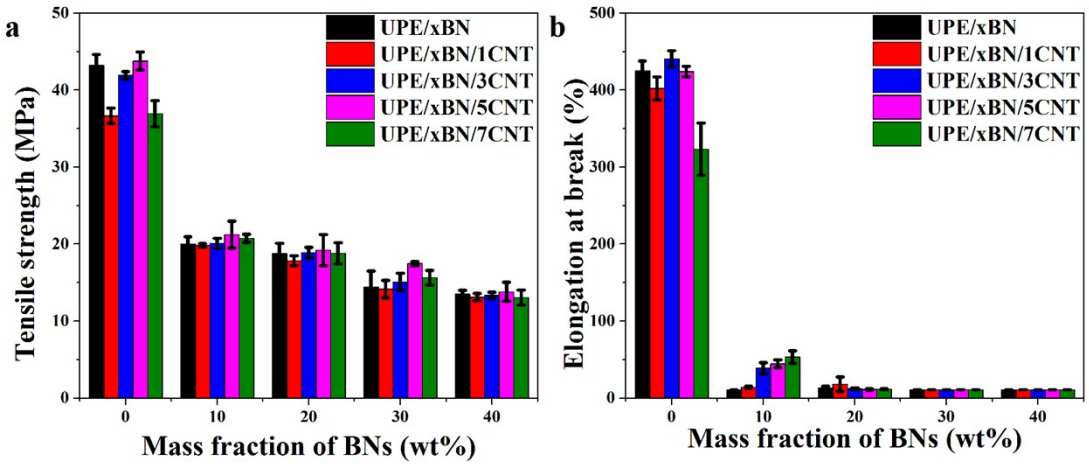

Figure S4. Tensile strength (a) and Elongation at break (b) of the UPE composites.

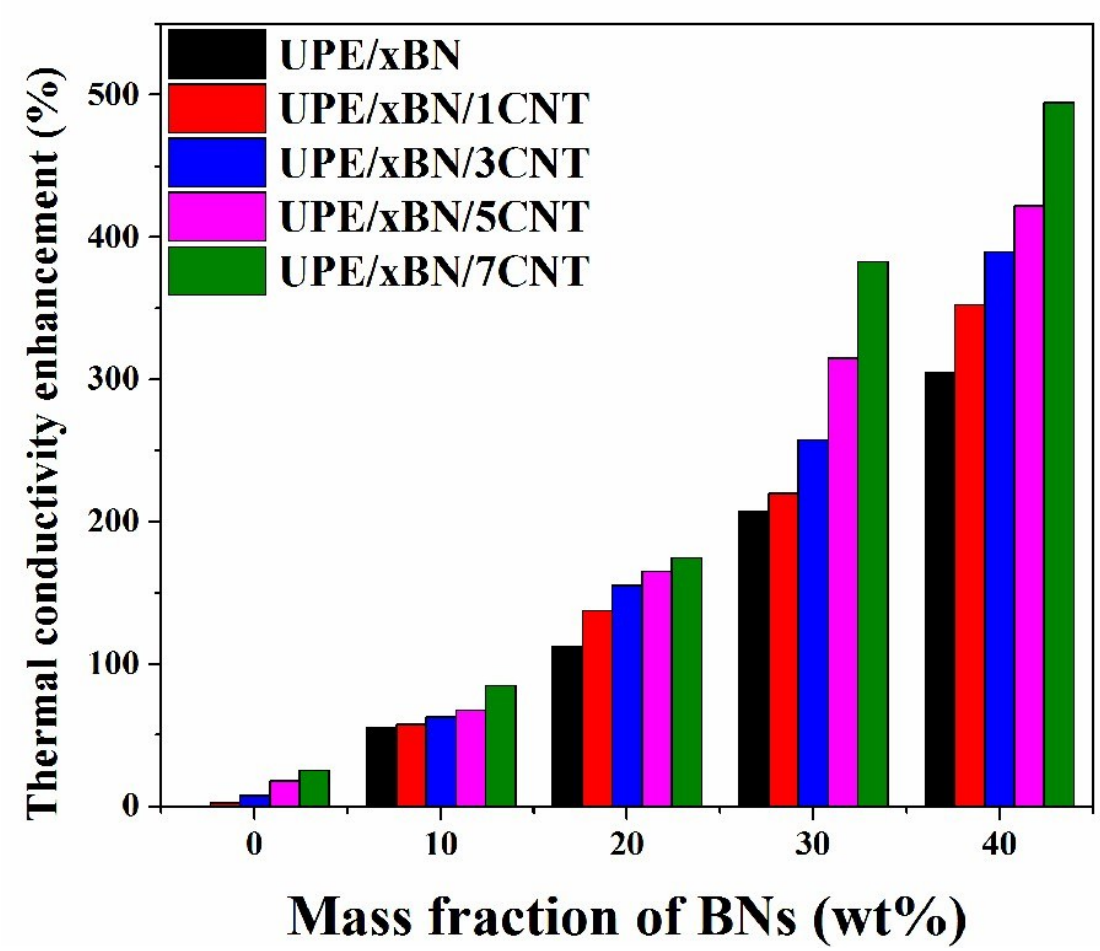

Figure S5. Thermal conductivity enhancement of the UPE composites compared with pure UPE.

Table S1 DSC thermal parameters of the UPE/CNT composites

Sample	T_m (°C)	ΔH_m (J/g)	Tc (°C)	ΔH_c (J/g)	Xc (%)
UPE	137.4	159.4	116.0	159.9	54.83
UPE/1CNT	139.6	131.3	114.3	130.7	45.73
UPE/3CNT	139.3	136.6	114.2	134.9	48.56
UPE/5CNT	138.9	136.4	115.5	138.8	49.51
UPE/7CNT	137.0	137.2	117.3	135.7	51.42
UPE/10CNT	136.8	126.5	117.4	127.0	48.46

Table S2 Thermal data of UPE/CNT composites from TGA

Sample	Weight loss temperature (°C)				T_{HRI}[b] (°C)	Residual weight (%)
	T_5	T_{30}	T_{50}	T_{max}[a]		
UPE	431.7	458.6	467.4	473.6	219.4	0
UPE/3CNT	441.5	468.1	476.5	479.8	224.2	3.24
UPE/5CNT	457.5	478.7	485.6	488.3	230.4	4.92
UPE/7CNT	458.4	478.8	485.6	487.3	230.6	7.03
UPE/10BN/3CNT	451.0	475.1	482.9	484.8	228.1	13.01
UPE/20BN/3CNT	453.6	478.3	486.7	486.3	229.5	22.68
UPE/30BN/3CNT	458.1	481.4	490.3	486.9	231.3	32.65
UPE/40BN/3CNT	458.2	481.6	491.2	486.1	231.4	42.7

Table S3 Tensile strength data for UPE composites.

tensile strength (MPa)	0BN	10BN	20BN	30BN	40BN
0CNT	43.21	20.0	18.76	14.42	13.48
1CNT	36.66	19.84	17.83	14.16	13.11
3CNT	41.90	20.10	18.88	15.09	13.34
5CNT	43.77	21.23	19.20	17.46	13.80
7CNT	36.94	20.76	18.80	15.63	13.05