Electronic Supplementary Information (ESI) for

Lightweight and conductive carbon black/chlorinated poly(propylene carbonate) foams with remarkable negative temperature coefficient effect of resistance for temperature sensor applications

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Table S1 Formulations of the mixed compounds of CPPC before foaming

composites	CPPC (wt%)	CB (wt%)	AC (wt%)	ZnO (wt%)	DCP (wt%)	TAIC (wt%)
a-1	95.6	0.0	4.0	0.4	0.0	0.0
a-2	94.6	1.0	4.0	0.4	0.0	0.0
a-3	94.1	1.5	4.0	0.4	0.0	0.0
a-4	93.6	2.0	4.0	0.4	0.0	0.0
a-5	93.1	2.5	4.0	0.4	0.0	0.0
a-6	92.6	3.0	4.0	0.4	0.0	0.0
a-7	92.1	3.5	4.0	0.4	0.0	0.0
a-8	91.6	4.0	4.0	0.4	0.0	0.0
a-9	90.6	5.0	4.0	0.4	0.0	0.0
a-10	89.6	6.0	4.0	0.4	0.0	0.0
a-11	88.6	7.0	4.0	0.4	0.0	0.0
b-1	91.6	0.0	4.0	0.4	2.0	2.0
b-2	90.6	1.0	4.0	0.4	2.0	2.0
b-3	90.1	1.5	4.0	0.4	2.0	2.0
b-4	89.6	2.0	4.0	0.4	2.0	2.0
b-5	89.1	2.5	4.0	0.4	2.0	2.0
b-6	88.6	3.0	4.0	0.4	2.0	2.0
b-7	88.1	3.5	4.0	0.4	2.0	2.0
b-8	87.6	4.0	4.0	0.4	2.0	2.0
b-9	86.6	5.0	4.0	0.4	2.0	2.0

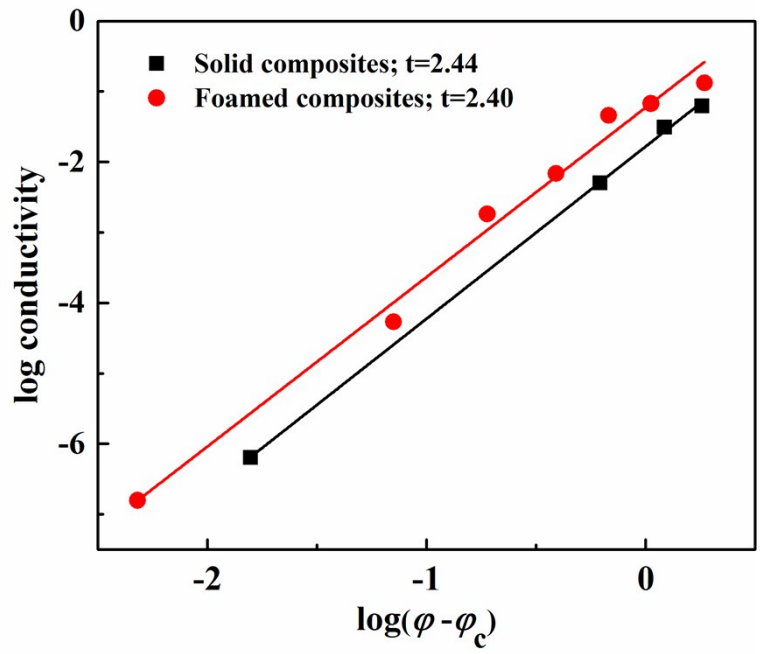

Fig. S1 Linear fits of log conductivity vs. log ($\varphi - \varphi_c$) for solid CB/CPPC composites and foamed CB/CPPC composites.

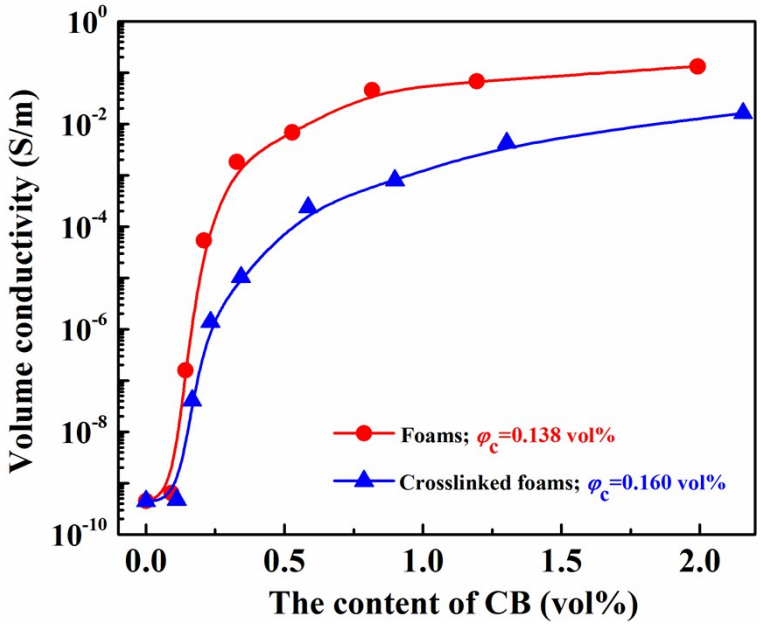

Fig. S2 The volume conductivity of CB/CPPC foams and crosslinked foams as a function of the content of CB (vol%).

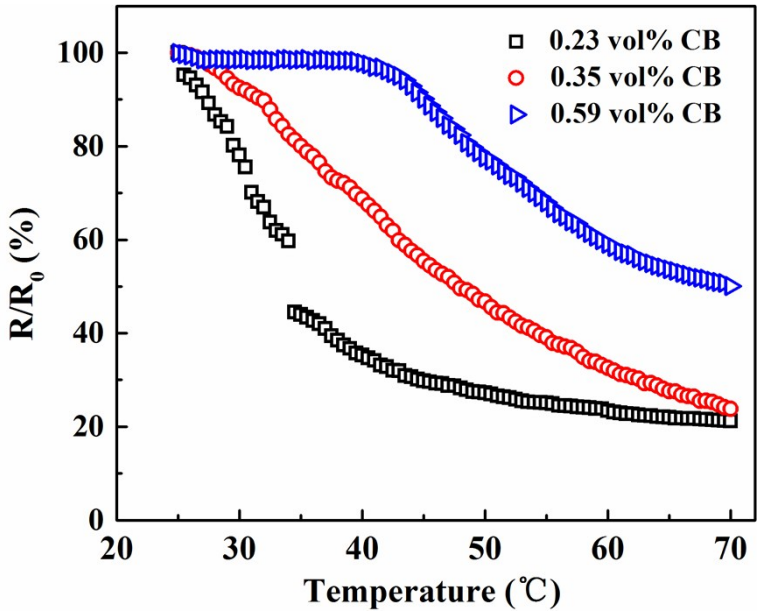

Fig. S3 The normalized resistance (R/R_0) as a function of temperature from 25 °C to 70 °C for crosslinked CB/CPPC foams with CB content of 0.23 vol%, 0.35 vol% and 0.59 vol%.

Description of Supporting Information Video

Video S1 The crosslinked CB/CPPC foam (0.35 vol% CB) was connected with a LED lamp in a 6 V circuit. The foam sample was put in air at room temperature at first and then placed in an oven at 60 °C. Finally, the sample was taken out from the oven and put in air at room temperature again. The video recorded the change of lamp's brightness.