Supporting Information For

Cellulose/Silica Composite Microtubular Superfoam with Excellent Flame Retardancy, Thermal Insulation and Ablative Resistance

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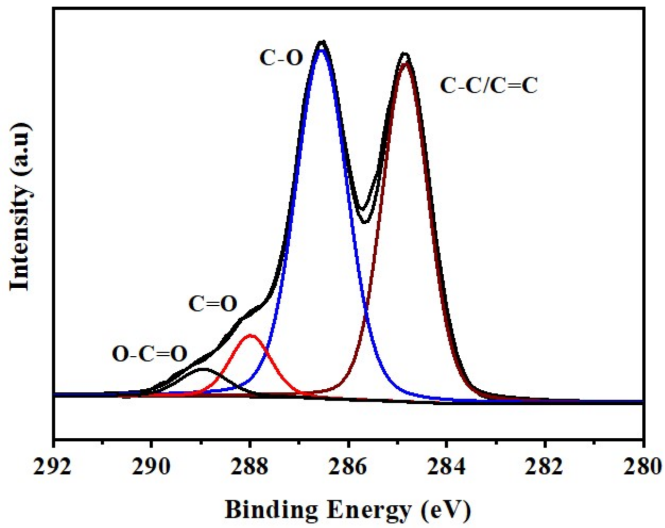

Fig. S1 High-resolution C 1s XPS spectrum of the poplar sawdust.

Table S1 The pore structure parameters of the poplar sawdust and the delignified cellulose microtube.

Sample	$S_{BET}(m^2\ g^{-1})$	$V_{total}\ (cm^3\ g^{-1})$	$D_{average}$ (nm)
The poplar sawdust	2.9	0.0040	9.8
the delignified cellulose microtube	4.8	0.0083	8.1

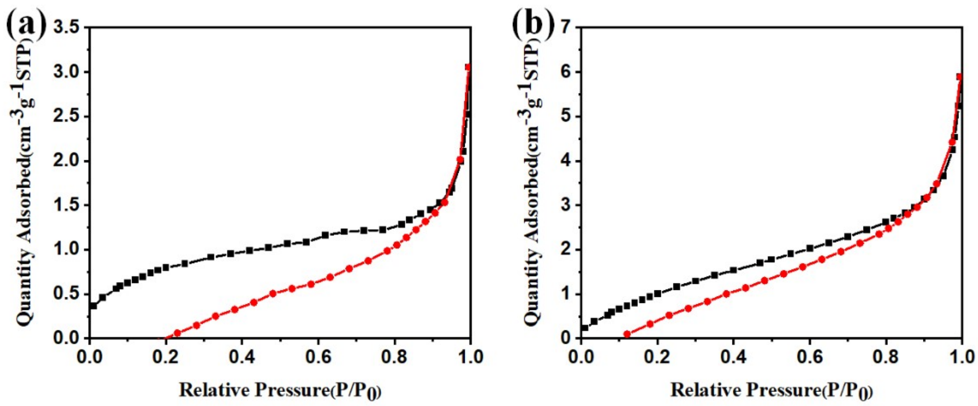

Fig. S2 N_2 adsorption-desorption isotherm of the poplar sawdust and the delignified cellulose microtube.

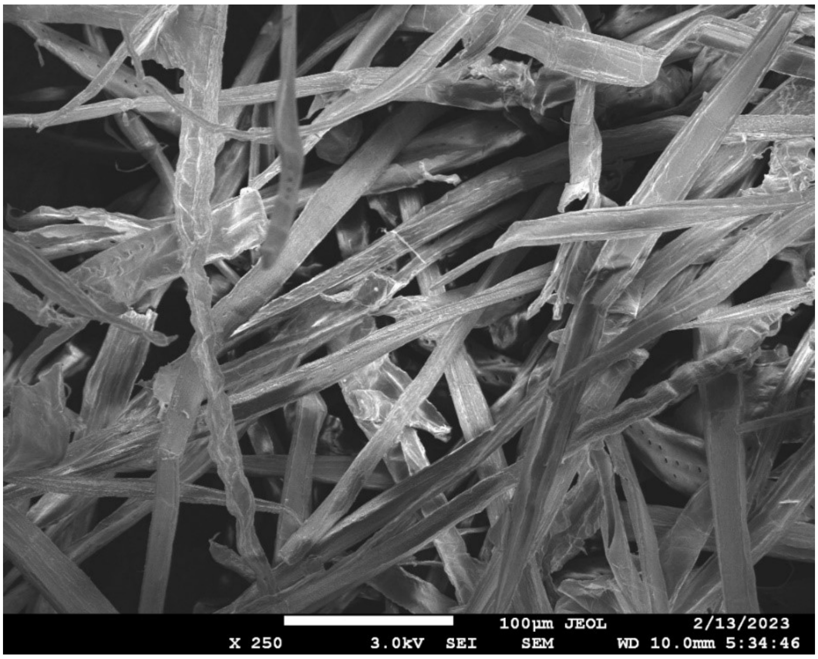

Fig. S3 SEM image of the delignified cellulose microtube

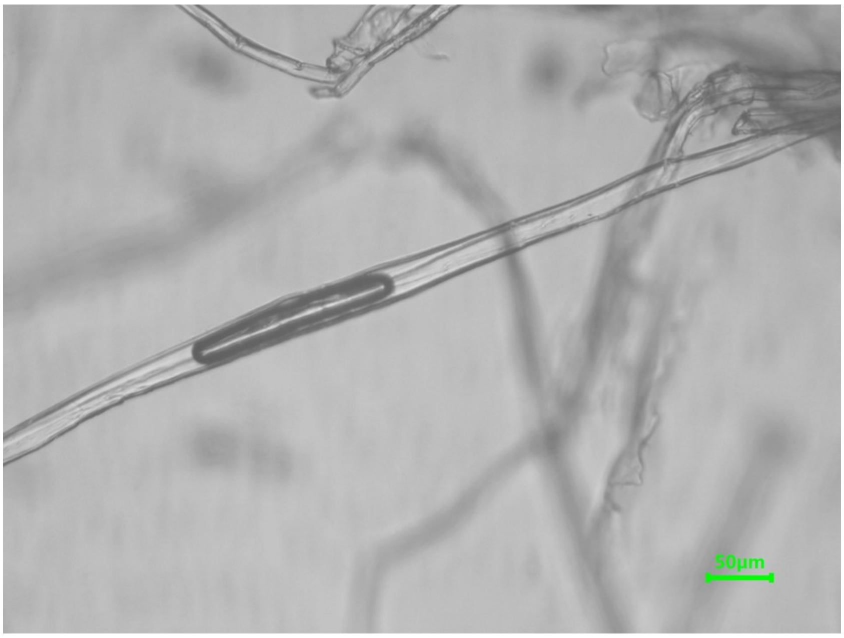

Fig. S4 Bubbles that appear transiently in cellulose microtubules after the precursor solution (1:5:4) is adsorbed by cellulose microtubules.

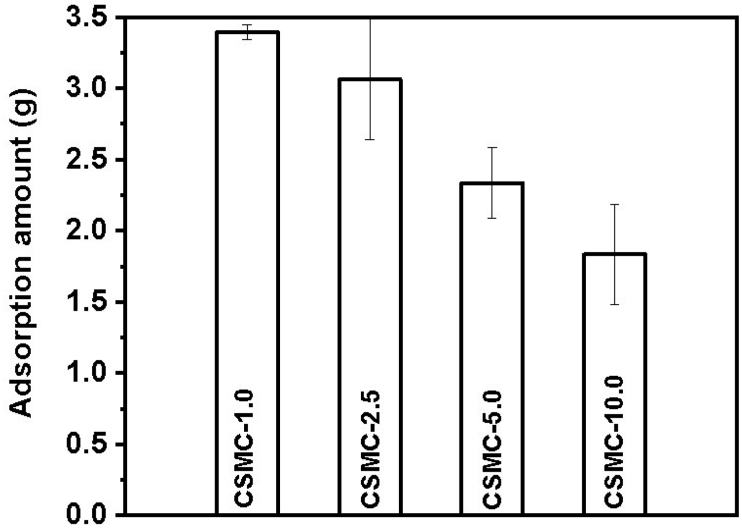

Fig. S5 The mass of the different SiO_2 aerogel precursor solution adsorbed by cellulose microtubules (0.5 g).

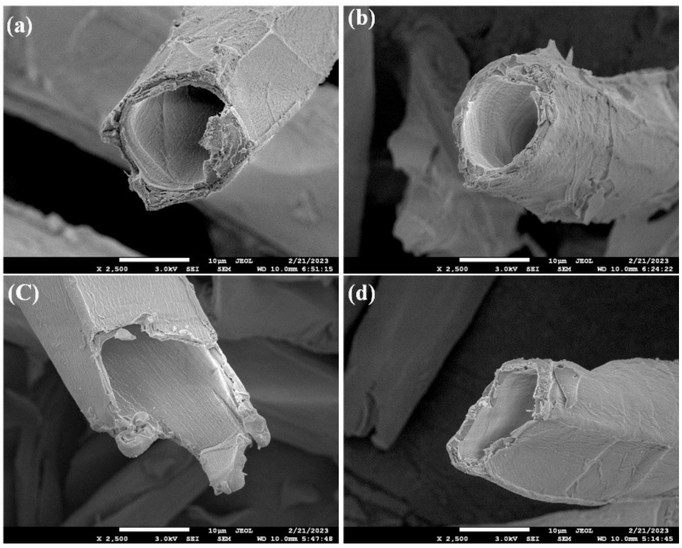

Fig. S6 SEM image of the CSMC-X super foam (a) CSMC-10.0, (b) CSMC-5.0, (c) CSMC-2.5, and (d) CSMC-1.0.

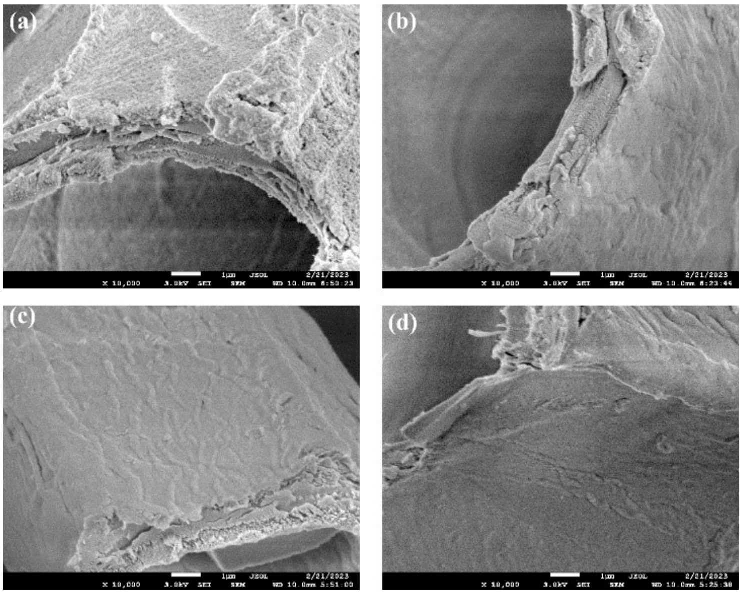

Fig. S7 SEM image of the CSMC-X super foam.

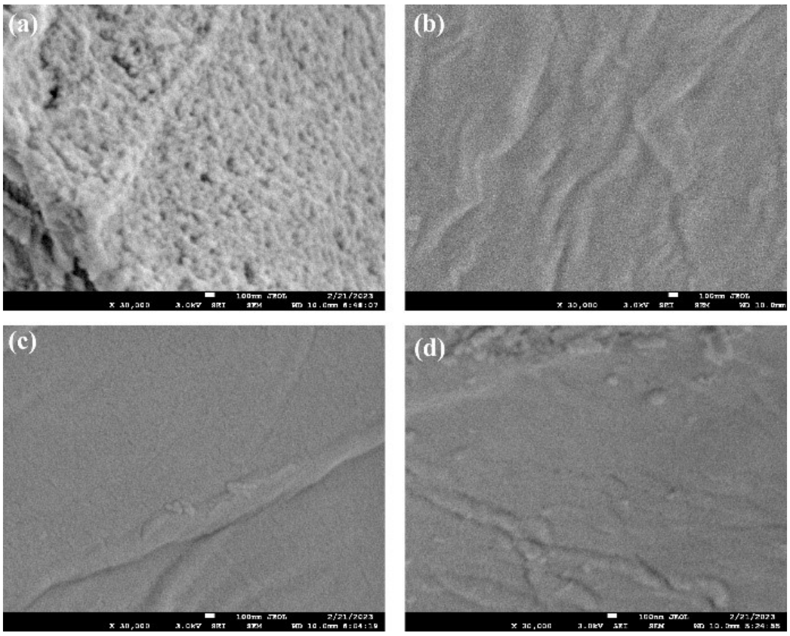

Fig. S8 SEM image of the CSMC-X super foam.

Table S2 The pore structure parameters of the poplar sawdust and the delignified cellulose microtube.

Sample	S_{BET}(m^2 g^{-1})	V_{total} (cm^3 g^{-1})	$D_{average}$ (nm)
CSMC-1.0	159	0.1081	2.7
CSMC-2.5	120	0.1051	3.4
CSMC-5.0	57	0.0507	3.5
CSMC-10.0	7	0.0193	10.9

Fig. S9 The image of the CSMC-5.0 super foam could withstand 1005 times its own mass.

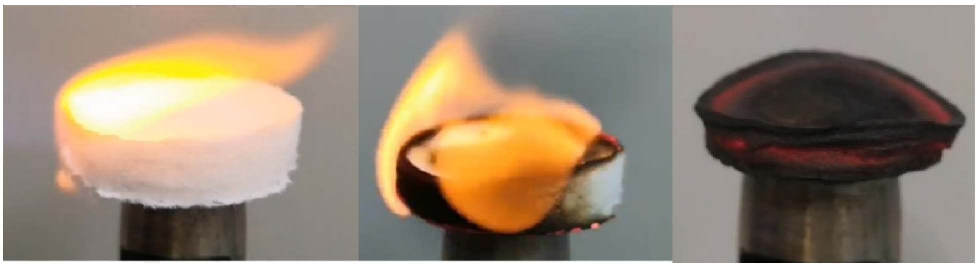

Fig. S10 Combustion behavior of the cellulose microtubule foam.

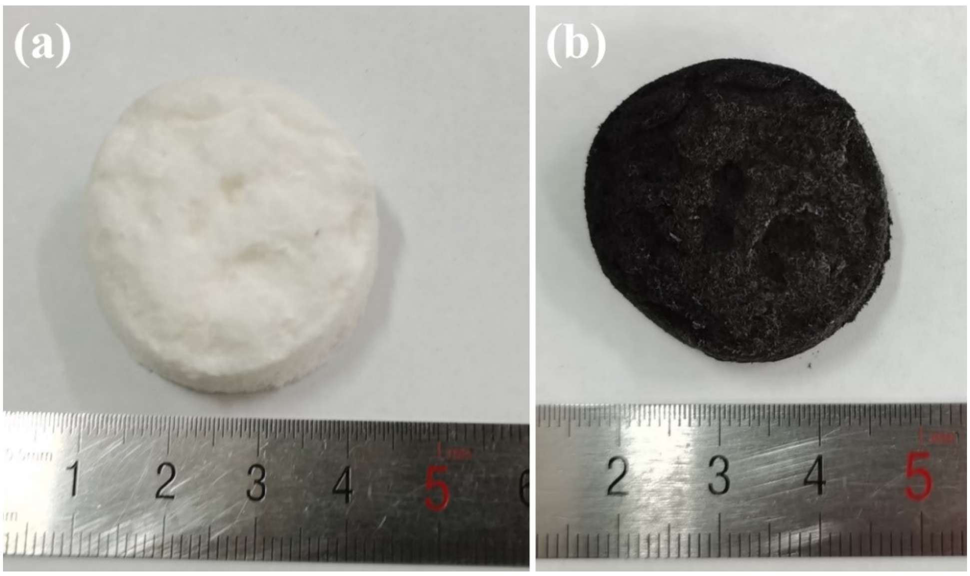

Fig. S11 The image of the CSMC-5.0 super foam before (a) and after (b) burning with butane flame for 5 minutes.

Fig. S12 The image of the B-CSMC-5.0 super foam could withstand about 269 times its own mass.

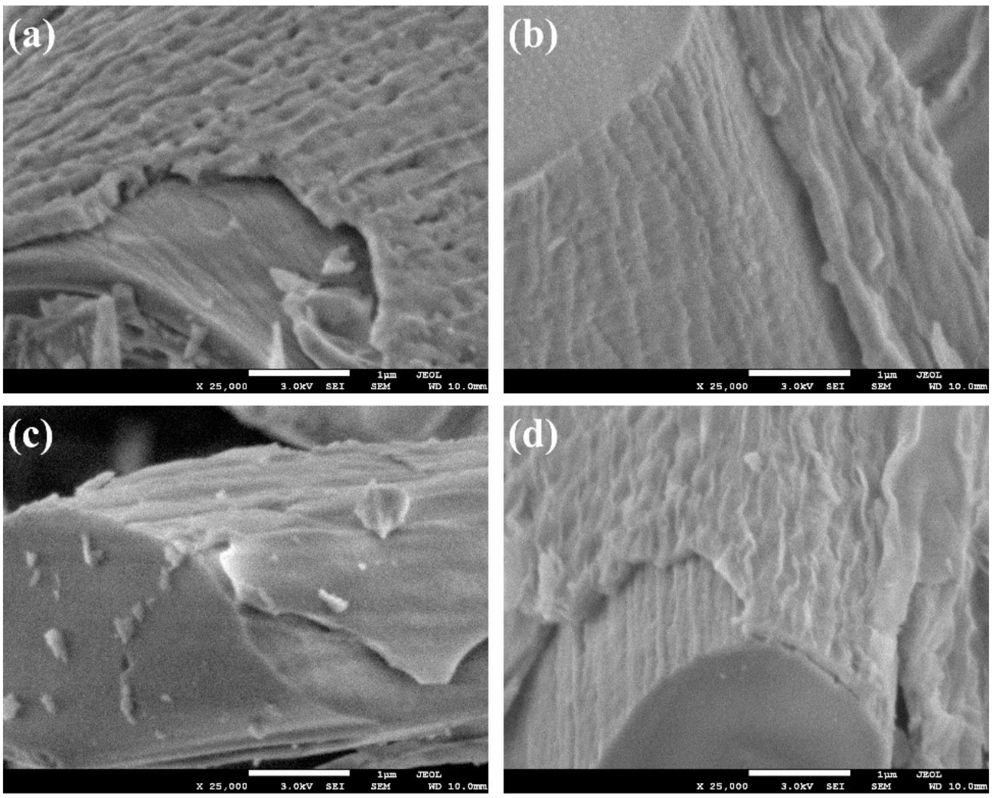

Fig. S13 SEM of the B-CSMC-10.0 (a), B-CSMC-5.0 (b), B-CSMC-2.5 (c), and B-CSMC-1.0 (d) super foam after being rapidly burned by the butane blowtorch flame for about 5 min.

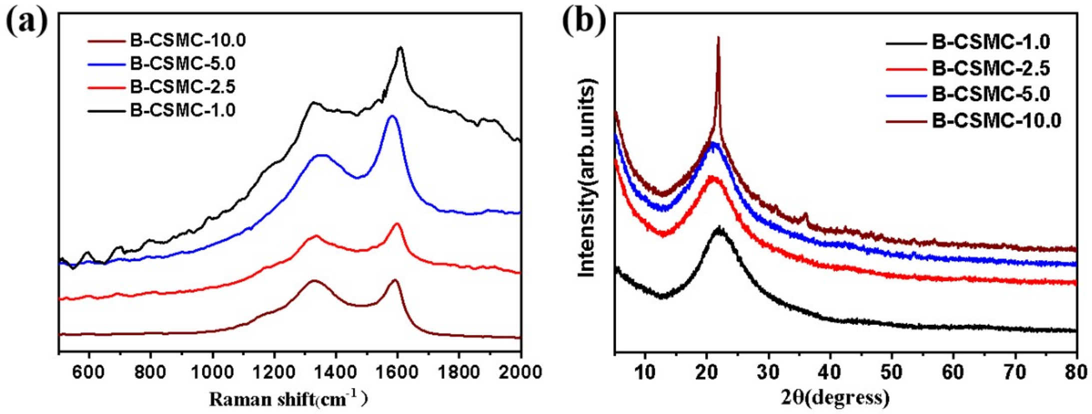

Fig. S14 Raman of the B-CSMC-X superfoam (a) and XRD of the B-CSMC-X superfoam (b).

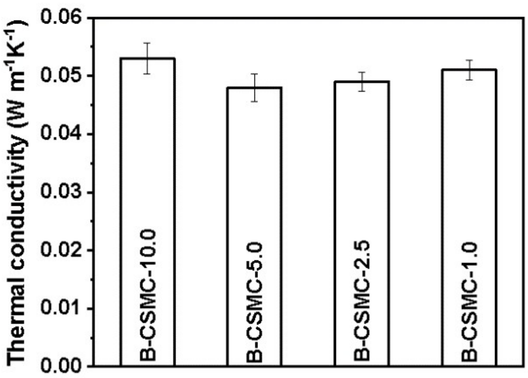

Fig. S15 The thermal conductivity of the B-CSMC-X superfoam.

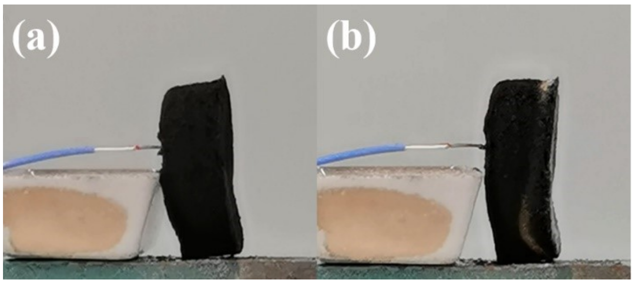

Fig. S16 Picture of the B-CSMC-5.0 superfoam before (a) and after (b) being burned by a butane flame for 3600 s.

Fig. S17 Picture of the burning surface of the B-CSMC-X superfoam after being burned by a butane flame for 3600 s.