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Supporting information

Phase Change Material with Anisotropically High Thermal Conductivity and Excellent Shape Stability in Virtue of Robust Cellulose/BNNSs Skeleton

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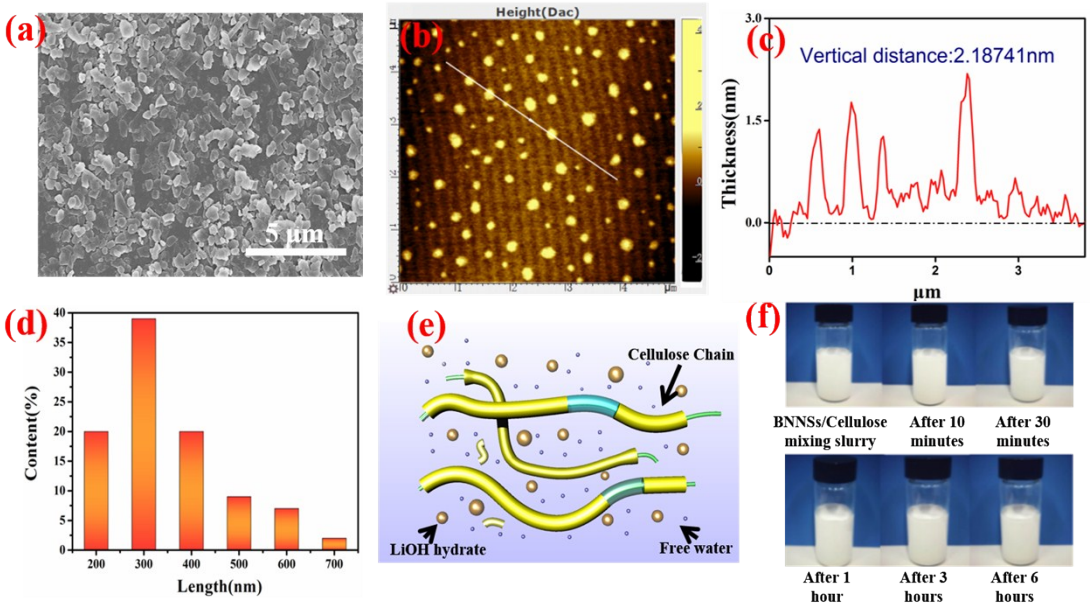

Fig. S1 (a) SEM image of BNNSs. (b) AFM topographic image of BNNSs. (c) Thickness statistical results of BNNSs to AFM image. (d) Lateral size statistical results of BNNSs to SEM images. (e) Image of mechanism of dissolving cellulose of alkali/urea system. (f) Images of BNNSs/Cellulose mixing slurry after different hours placed.

Table S1 the specific latent heat fusion of 3D-10BNNSs-scaffold/PEG composite after 100 times heating and cooling process.

Samples	T_{cp} (°C)	ΔH_{cc} (J g^{-1})	T_{mp} (°C)	ΔH_{mc} (J g^{-1})
1 cycle	41.6	122.8	60.2	136.8
51 cycles	38.9	124.4	60.9	139.5
101 cycles	38.1	125.4	61.1	135.9

Table S2 the specific latent heat fusion of random 10f-BNNSs/PEG composite after 100 times heating and cooling process.

Samples	T_{cp} (°C)	ΔH_{cc} (J g^{-1})	T_{mp} (°C)	ΔH_{mc} (J g^{-1})
1 cycle	40.8	115.8	62.9	132.5
51 cycles	39.9	113.8	60.7	122.8
101 cycles	40.3	105.8	60.8	118.1

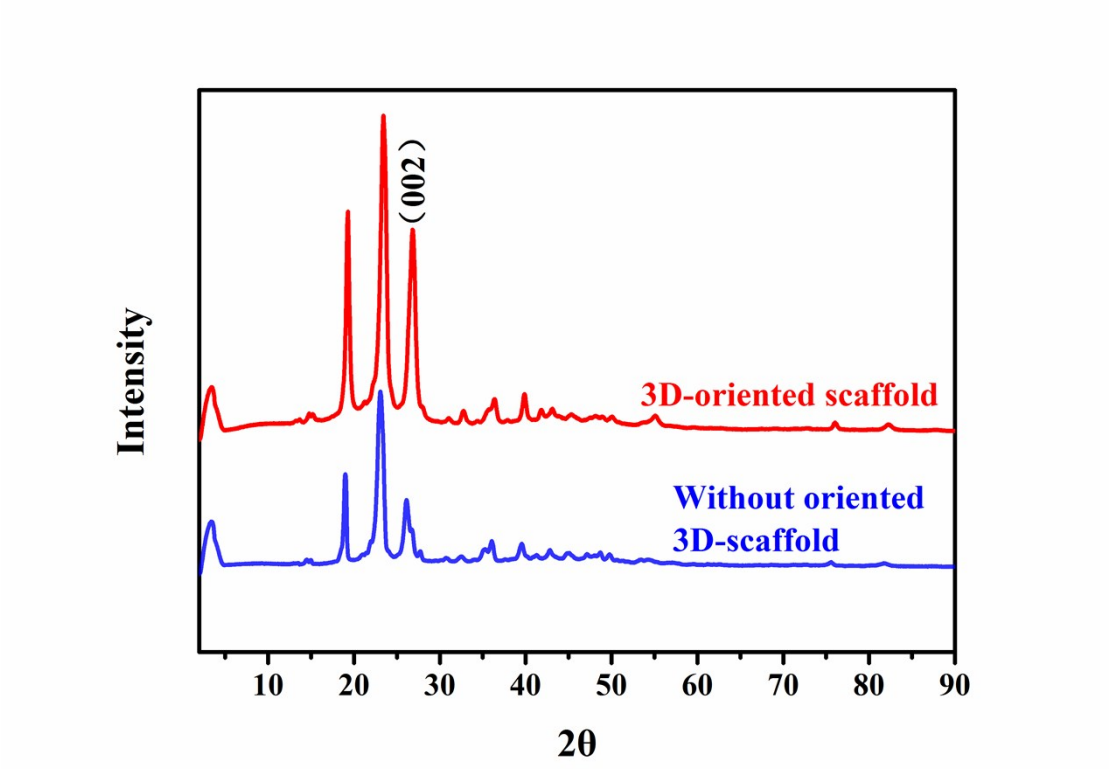

Fig. S2 XRD spectra of 3D oriented scaffold composites and without oriented scaffold composites

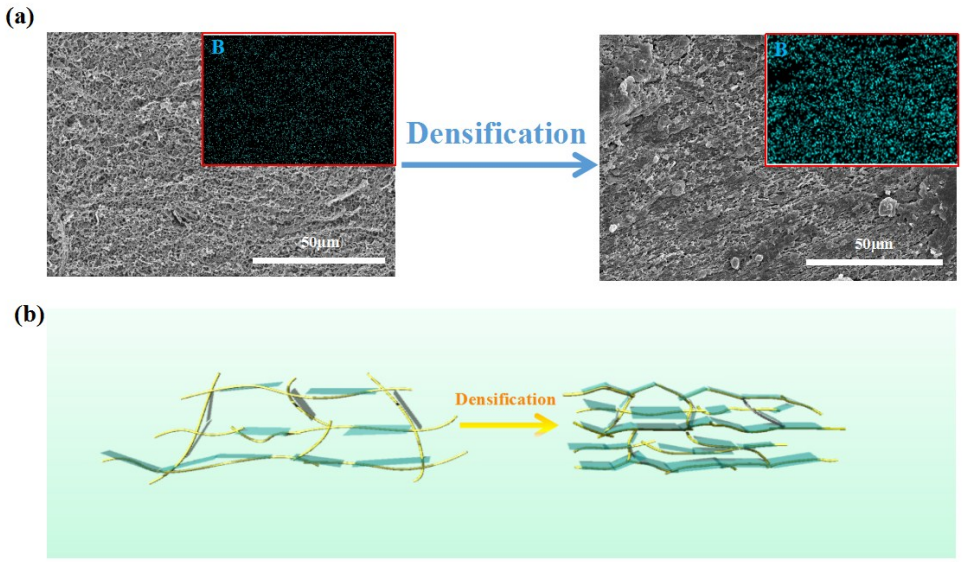

Fig. S3 (a) SEM images and EDS mapping images of cross section of random 3D-BNNSs/PEG and oriented 3D-BNNSs/PEG: B (blue) (b) Scheme illustrating the mechanism of densification of inner structure of composites.

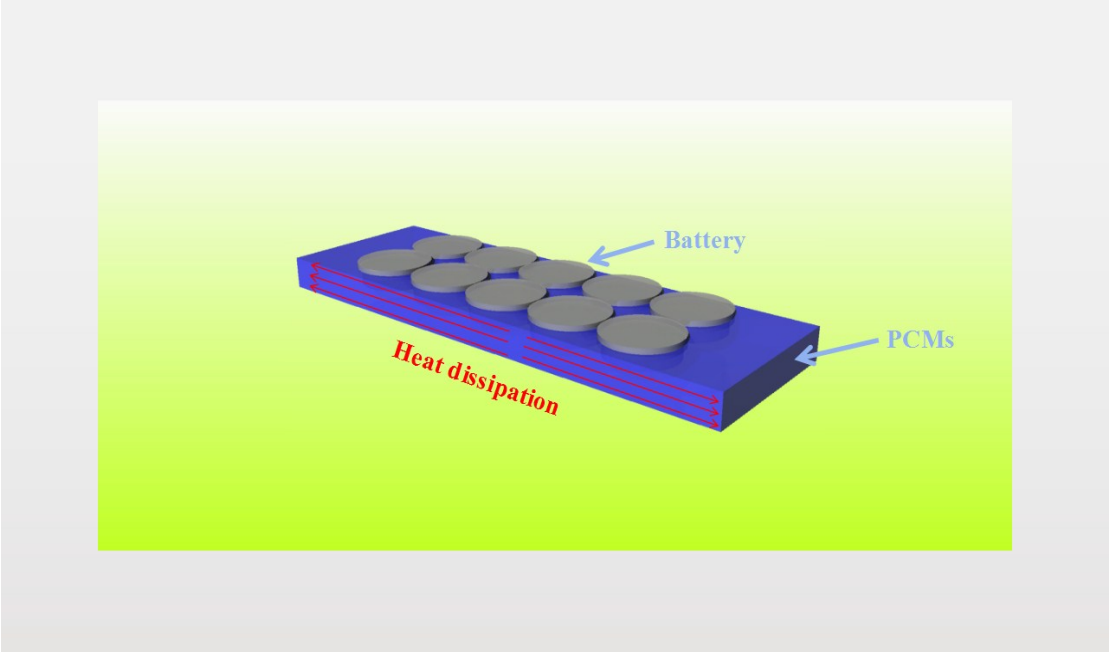

Fig. S4 Potential application of designed PCMs in thermal management in battery systems.