

Support Information

Robust composite film with high thermal conductivity and excellent mechanical properties via constructing long-range ordered sandwich structure

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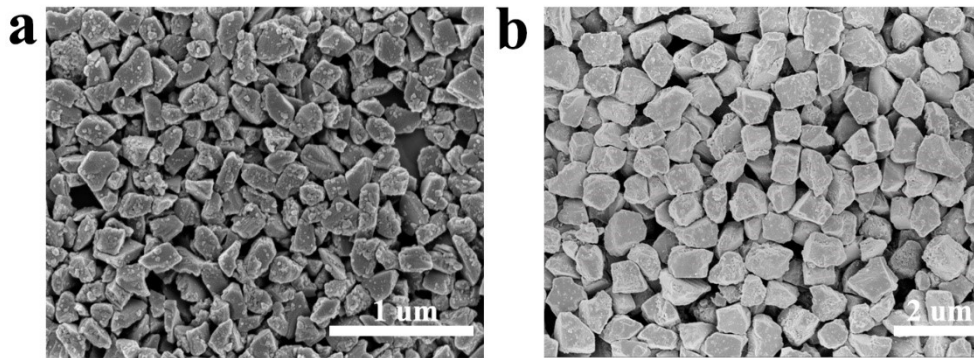


Figure S1. (a) The SEM image of nanodiamond; (b) The SEM image of microdiamond.

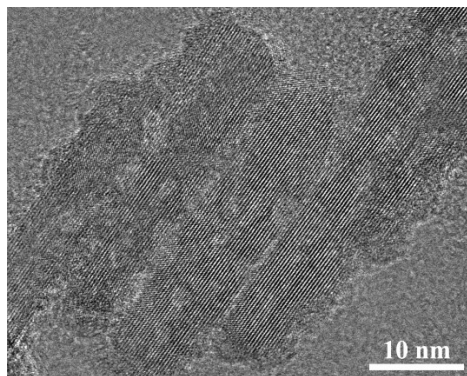


Figure S2. The edge lattice fringes characterization of BBNS.

Table S1. The average surface roughness of different composite films.

Samples	CNF-BNNS-hDB	CNF-BNNS-ND	CNF-BNNS-uD	CNF-BNNS-hD
Roughness (um)	0.894	0.347	0.349	0.244

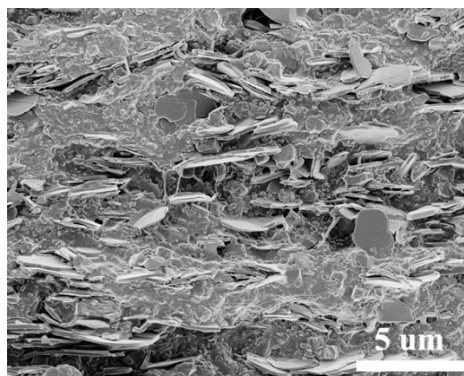


Figure S3. The cross-section image of CNF-BNNS-hDB composite.

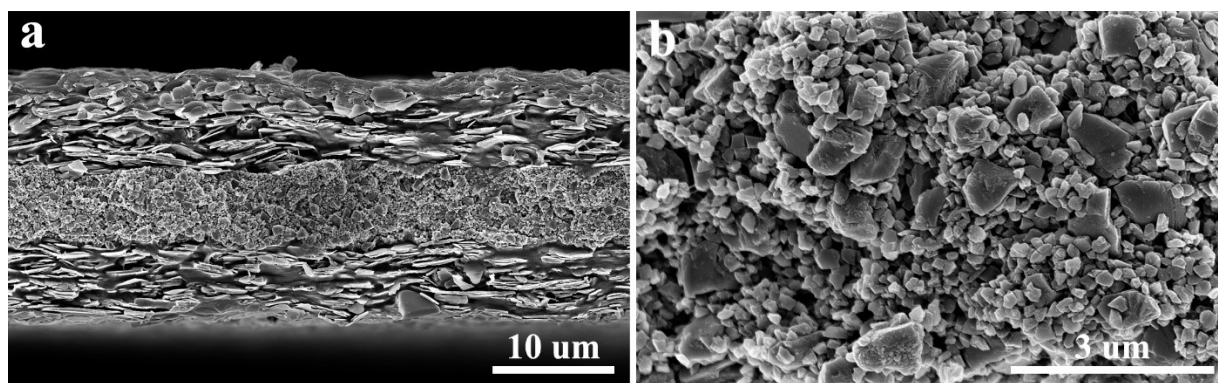


Figure S4. (a) The cross-section image of CNF-BNNS-hD composites film; (b) The partial enlarged image of diamond layer.

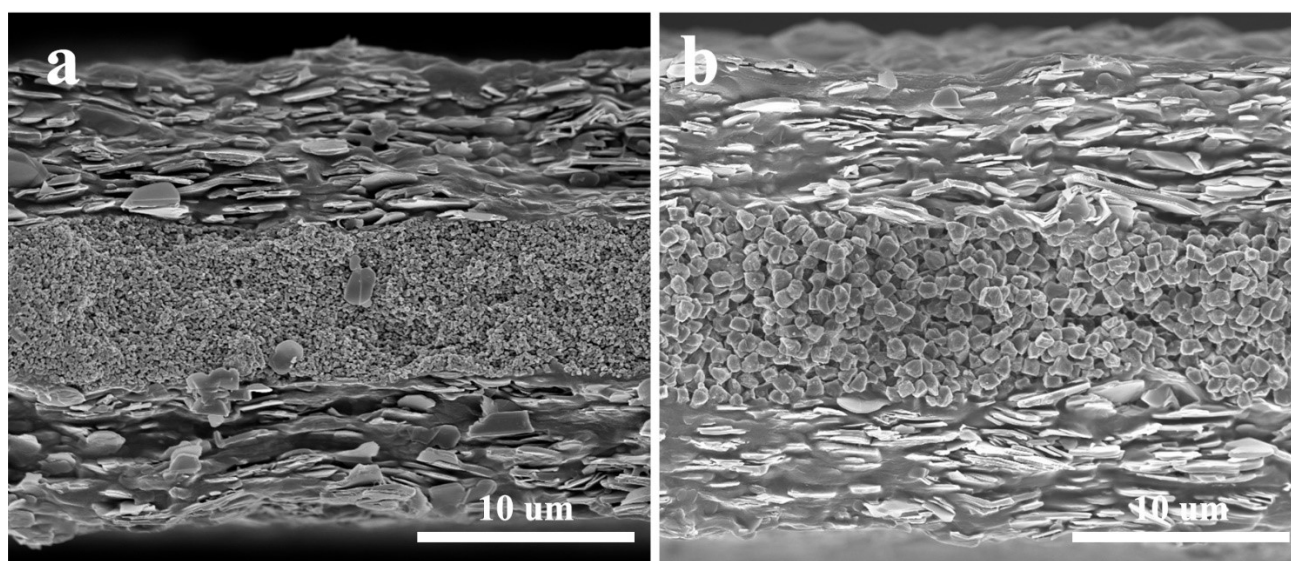


Figure S5. (a) The cross-section image of CNF-BNNS-ND composites film; (b) The cross-section image of CNF-BNNS-uD composites film.

Table S2. The density of different composite films.

Samples	CNF-BNNS-hDB	CNF-BNNS-ND	CNF-BNNS-uD	CNF-BNNS-hD
Density (g/cm ³)	1.77	1.89	1.94	2.01

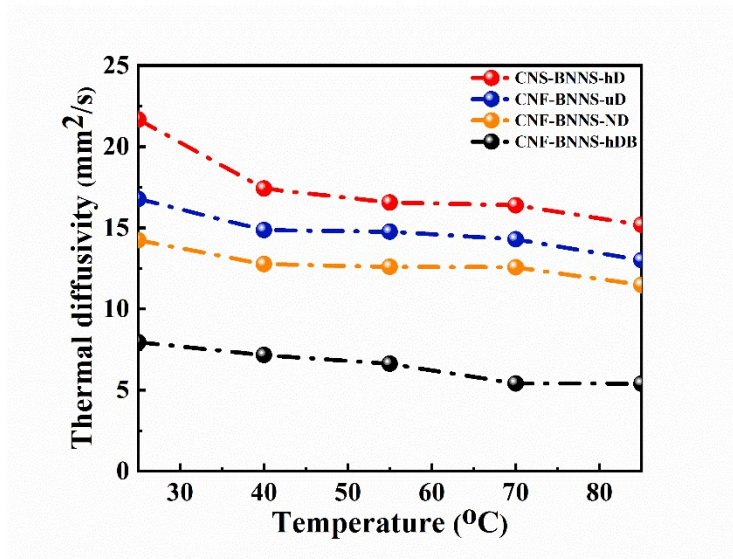


Figure S6. The thermal diffusivity of different composite film.

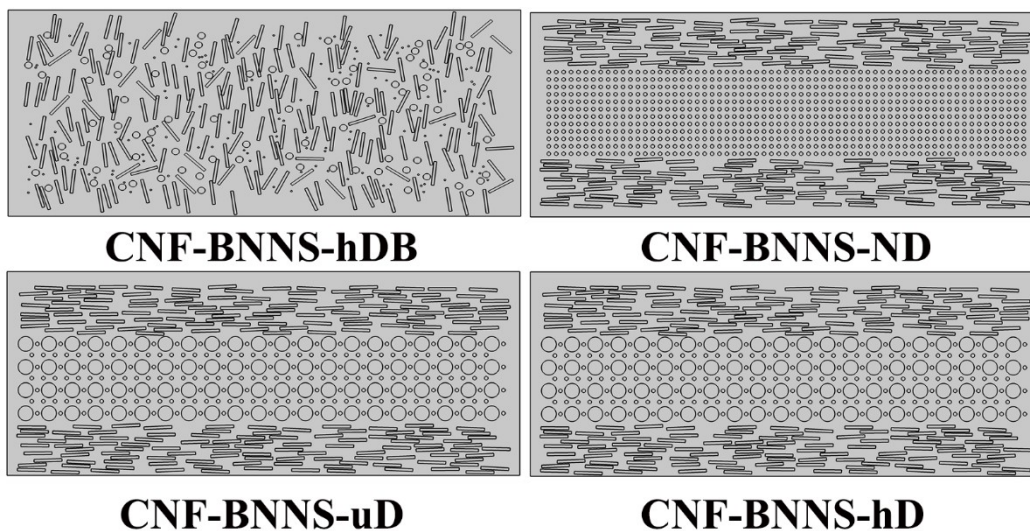


Figure S7. The calculated model of different composite films.

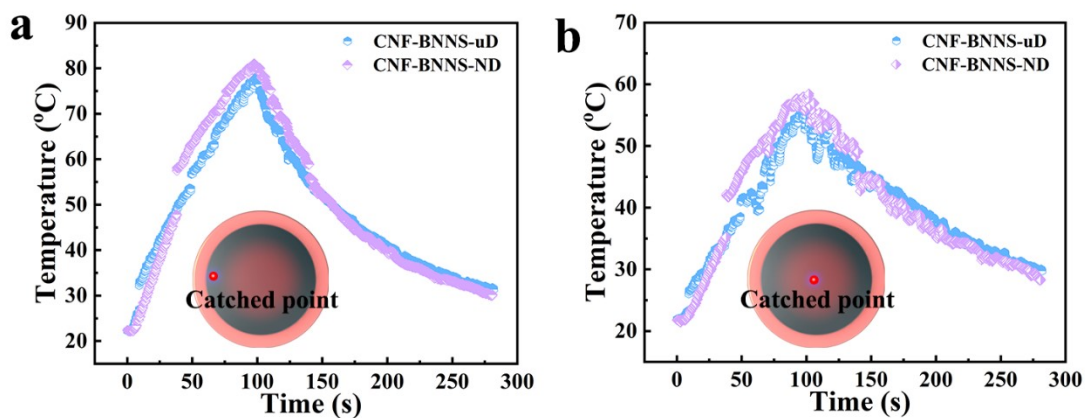


Figure S8. The temperature of the edge (a) and center (b) point of the CNF-BNNS-uD and CNF-BNNS-ND films.

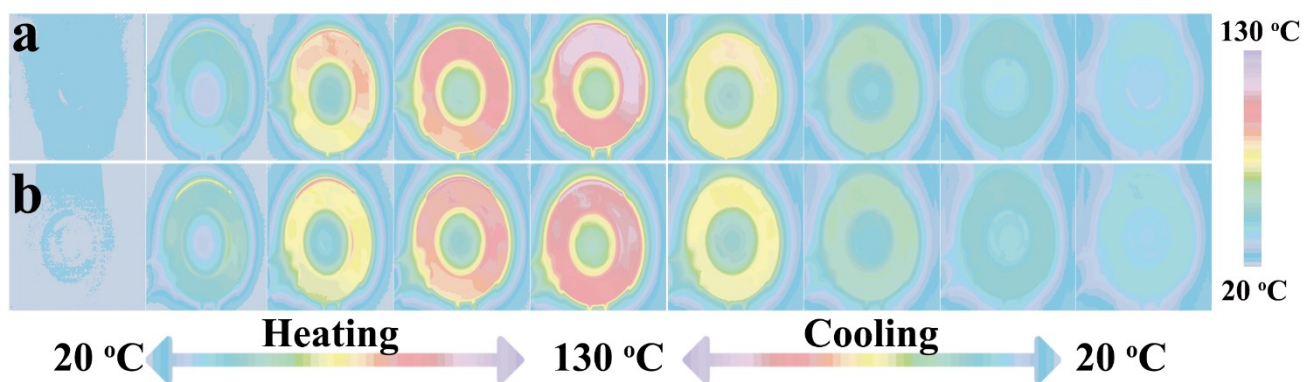


Figure S9. (a) and (b) The isotherm images of CNF-BNNS-uD and CNF-BNNS-ND films, respectively.