



Supporting Information

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Necklace-Like Silicon Carbide and Carbon Nanocomposites
Formed by Steady Joule Heating

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SUPPLEMENTARY INFORMATION

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Figure S1. A photography of pristine CSNF film

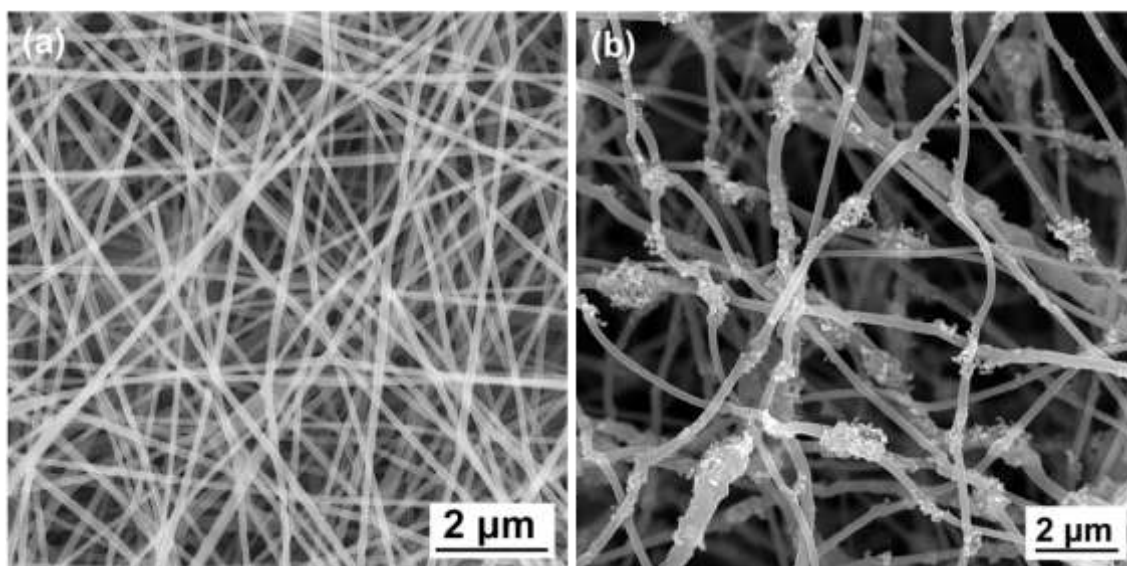


Figure S2. (a) Conventional carbon nanofibers with smooth fiber surface in long-range scale. (b) CSNF with twig-like morphology, in which the nods greatly decrease the conductivity of the sample.



Figure S3. A typical setup for Joule heating with CSNF nanocomposite film

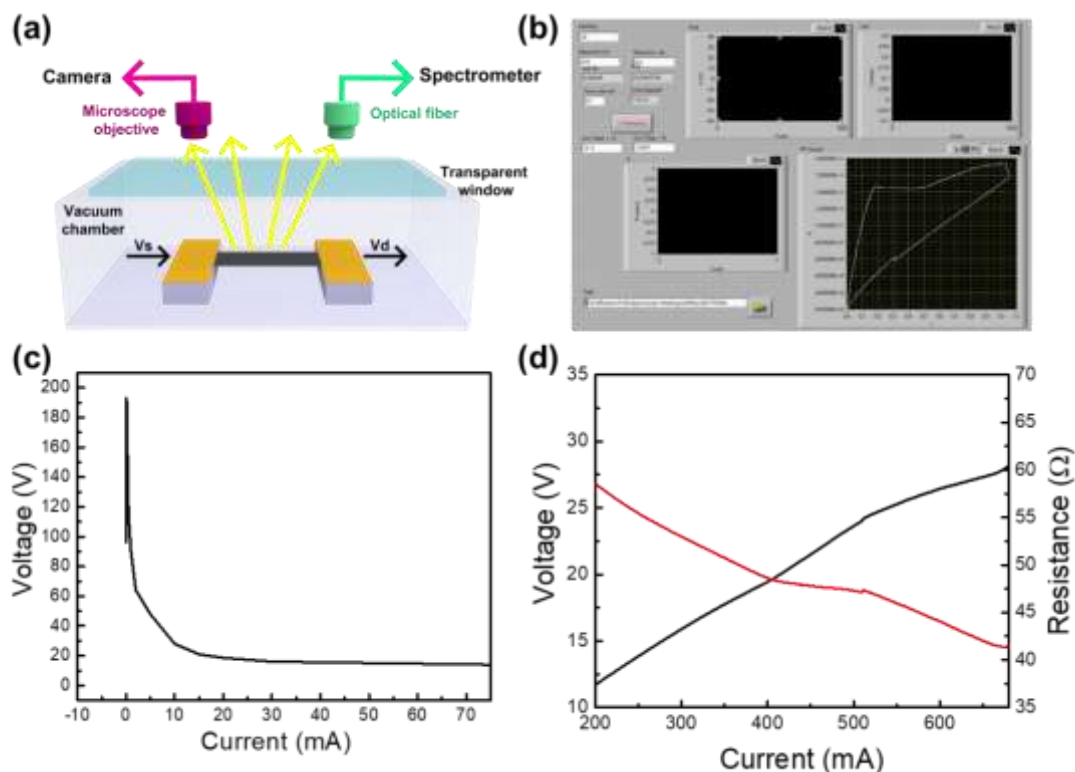


Figure S4. (a) Schematic of the method for Joule heat control and temperature acquirement. (b) Program interface to control the current applied on the sample. (c) the voltage-current curve for initial process when the sample is highly resistive: a small current is applied on the sample to decrease the resistivity of the sample. (d) the voltage-current curve after a huge decrease in resistance. The black curve is the voltage, and the red curve is the resistance change during the increase of current.

The Brunauer–Emmett–Teller (BET) surface area analysis (BET, Micromeritics ASAP2020), was carried out, the result of which presented that the SiC/C composite nanofibers possess a BET surface area about 101.55 m²/g, consistent with that of carbon nanofiber achieved by electrospinning method.

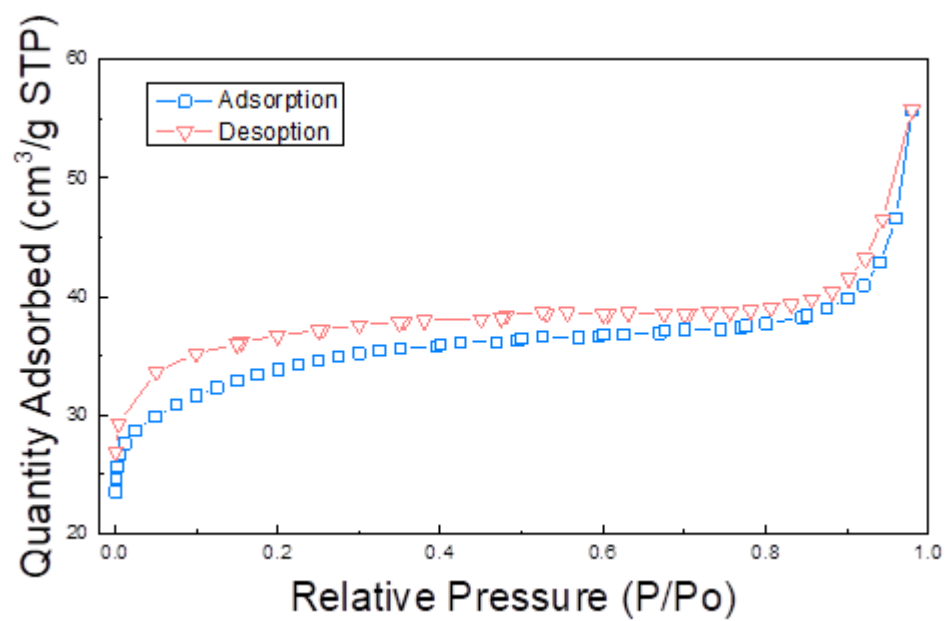


Figure S5. BET surface area analysis of SiC/C nanocomposite

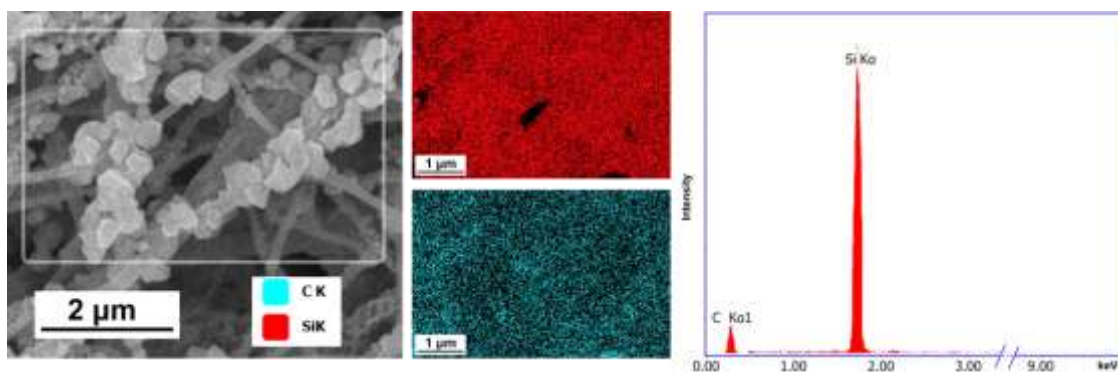


Figure S6. EDS mapping of the SiC/C nanocomposite after Joule heating for 10 min

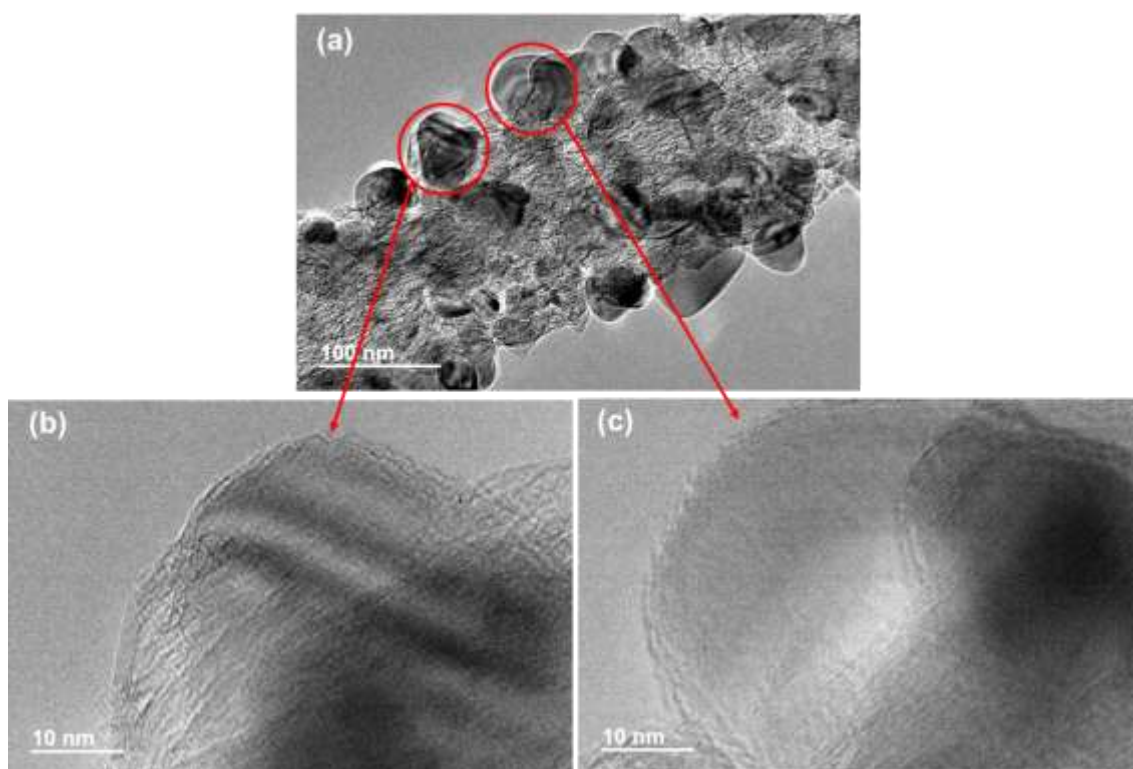


Figure S7. (a) TEM morphology of SiC/C nanocomposite. The crystallized SiC (b) and (c) are embedded in the amorphous carbon nanofibers.

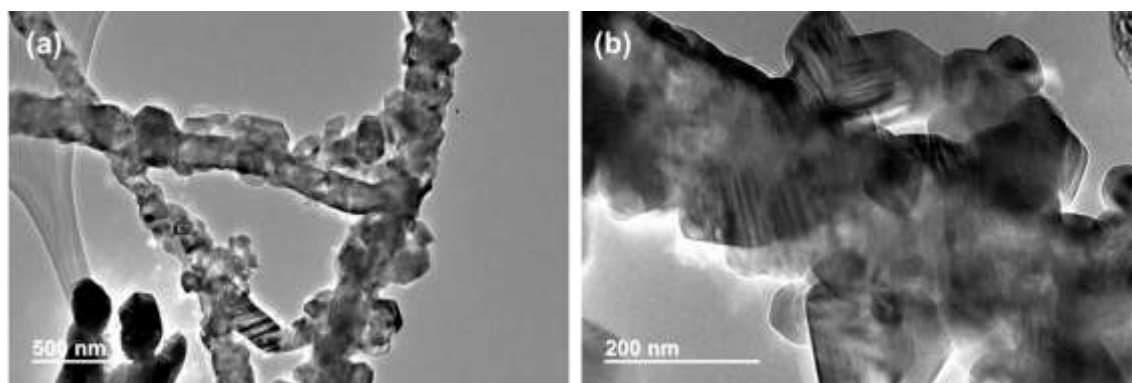


Figure S8. (a) and (b) TEM images for the sample after sonication for 24 h, presenting very nice bond strength between SiC nanoparticles and carbon nanofibers.