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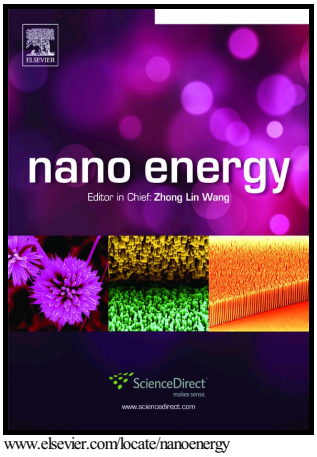

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Graphene nanopetal wire supercapacitors with high energy density and thermal durability

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Abstract

Wire supercapacitors have recently elicited attention due to their potential to be woven into textiles as flexible power supplies for wearable electronic devices. However, contemporary wire supercapacitors generally suffer from low energy density and complicated fabrication and assembly processes. Here, we report a unique design of asymmetric wire supercapacitors in a wrap-twist architecture, with graphene nanopetals grown on carbon fiber tow as negative electrodes and MnO_2 nanosheets electrodeposited on carbon nanotube paper as positive electrodes. The wrap-twist structure integrates both positive and negative electrodes with edge-enriched nanostructures, and a new assembly procedure greatly increases the contact area between the two electrodes, leading to significantly improved electrochemical performance. Such asymmetric wire supercapacitors exhibit ultrahigh capacitances of over 40 mF cm^{-1},

[1] These authors contribute equally to this work.

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