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Authors: Qi Li, Xinli Guo, Yao Zhang, Weijie Zhang, Chuang Ge, Li Zhao, Xiaojuan Wang, Hongyi Zhang, Jian Chen, Zengmei Wang, Litao Sun

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Porous graphene paper for supercapacitor applications

Qi Li ¹, Xinli Guo ^{1,*}, Yao Zhang ¹, Weijie Zhang ¹, Chuang Ge ¹, Li Zhao ¹, Xiaojuan Wang ¹,
Hongyi Zhang ¹, Jian Chen ¹, Zengmei Wang ¹, Litao Sun ²

¹ *Jiangsu Key Laboratory of Advanced Metallic Materials, School of Materials Science and Engineering, Southeast University, Nanjing 211189, China*

² *SEU-FEI Nano-Pico Center, Key Lab of MEMS of Ministry of Education, Southeast University, Nanjing 210096, China*

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* Corresponding author. Prof., Ph.D.; Tel.: +86 25 5209 0627; Fax: +86 25 52090627.

E-mail address: guo.xinli@seu.edu.cn (Xinli Guo).

Graphene paper shows a great promise for the electrical energy storage. However, the high stability, purity and specific surface area have become stringent requirements for supercapacitor applications. Finding methods to tackle these problems is rather challenging. Here, we develop a facile method to prepare porous graphene papers with a thickness 0.5 mm by a thermal shock to the layer-structure graphene paper self-assembled on Cu foil under nitrogen flowing. The as-prepared porous graphene paper exhibits a large specific capacitance of 100 F g⁻¹ at the scan rate of 100 mV s⁻¹ with high stability and purity without any residual chemical reagents, showing a promising potential for supercapacitor applications. The high electrochemical properties are mainly attributed to the high-specific area and the improved conductivity of the porous graphene paper performed by the multieffect of reducing, cleaving and expanding to the layer-structure graphene paper by high-energy thermal heating during the thermal shock process. This work paves a pathway to the facile preparation of porous graphene paper for supercapacitor applications.

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