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Authors: Tinghuan Wu, Lixian Sun, Fen Xu, Dan Cai

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Nitrogen-doped hierarchical porous carbon materials derived from diethylenetriaminepentaacetic acid（DTPA）for supercapacitors

Tinghuan Wu [1, 3], Lixian Sun [1, 2, 3, *], Fen Xu [1, 2, 3,*], Dan Cai [1, 2, 3]

[1] *School of Materials Science and Engineering, Guilin University of Electronic Technology, Guilin, 541004, China.*

[2] *Guangxi Key Laboratory of Information Materials, Guilin 541004, China.*

[3] *Guangxi Collaborative Innovation Center of Structure and Property for New Energy and Materials, Guilin 541004, China.*

* Corresponding author. Fax: +86 73 2303763

E-mail address: sunlx@guet.edu.cn (L.X. Sun)

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Nitrogen-doped porous carbon materials (NPCs) have been successfully fabricated by a simple one-step pyrolysis of diethylenetriaminepentaacetic acid (DTPA) in the presence of KOH. The as-synthesized NPCs displayed a high specific surface area (3214 m^2 g^{-1}) and a well-defined porous structure when the annealing temperature reached 800 ^oC, which showed superior electrochemical performance as supercapacitor electrode materials. Electrochemical tests showed that the NPCs achieved an impressive specific capacitance of 323 F g^{-1} at a current density of 0.5 A g^{-1} in 6 M KOH aqueous solution and an outstanding cycle stability, negligible specific capacitance decay after 5000 cycles at 10 A g^{-1}. This strategy offered a new insight into the preparation of novel carbon materials for the advanced energy storage devices, such as supercapacitors, fuel cells and lithium ion batteries.

Keywords: Supercapacitors; DTPA; Nitrogen-doped porous carbon materials;