

Author's Accepted Manuscript

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PII: S2211-2855(18)30381-1
DOI: <https://doi.org/10.1016/j.nanoen.2018.05.066>
Reference: NANOEN2774

To appear in: *Nano Energy*

Received date: 19 April 2018
Revised date: 14 May 2018
Accepted date: 25 May 2018

Cite this article as: Pei Hu, Chaoji Chen, Rui Zeng, Jingwei Xiang, Ying Huang, Dongfang Hou, Qing Li and Yunhui Huang, Facile Synthesis of Bimodal Porous Graphitic Carbon Nitride Nanosheets as Efficient Photocatalysts for Hydrogen Evolution, *Nano Energy*, <https://doi.org/10.1016/j.nanoen.2018.05.066>

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Facile Synthesis of Bimodal Porous Graphitic Carbon Nitride Nanosheets as Efficient Photocatalysts for Hydrogen Evolution

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Abstract

A novel, facile, and cost-effective approach has been developed for the preparation of hierarchically bimodal porous graphitic carbon nitride nanosheets (BP-g-C₃N₄) by KOH activation and thermal oxidation simultaneously. The BP-g-C₃N₄ demonstrates a high surface area of 219 m² g⁻¹, high porosity and hierarchically bimodal porous structure, which enhances the electron transport ability and photoreaction activity, enlarges the band gap, and prolongs the lifetime of the photoexcited charge carriers. Consequently, the BP-g-C₃N₄ exhibits a highly improved photocatalytic activity of 1900 μmol h⁻¹ g⁻¹ (8.6 times higher than that of bulk g-C₃N₄) towards hydrogen evolution and excellent cycling stability.

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