

Accepted Manuscript

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PII: S0169-4332(18)32285-2
DOI: <https://doi.org/10.1016/j.apsusc.2018.08.147>
Reference: APSUSC 40184

To appear in: *Applied Surface Science*

Received Date: 14 March 2018
Revised Date: 16 July 2018
Accepted Date: 18 August 2018

Please cite this article as: P. Xu, G. Wang, C. Miao, K. Cheng, K. Ye, K. Zhu, J. Yan, D. Cao, X. Zhang, Controllable one-pot synthesis of emerging β -Cu₂Se nanowire freely standing on nickel foam for high electrochemical energy storage performance, *Applied Surface Science* (2018), doi: <https://doi.org/10.1016/j.apsusc.2018.08.147>

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Controllable one-pot synthesis of emerging β -Cu₂Se nanowire freely standing on nickel foam for high electrochemical energy storage performance

Panpan Xu^a, Guiling Wang^{a,*}, wangguiling@hrbeu.edu.cn, Chenxu Miao^a, Kui Cheng^a, Ke Ye^a,

Kai Zhu^a, Jun Yan^a, Dianxue Cao^a, Xianfa Zhang^{b,*}, zhangxf_1982@126.com

^aKey Laboratory of Superlight Materials and Surface Technology of Ministry of Education, College of Materials Science and Chemical Engineering, Harbin Engineering University, Harbin 150001, P.R.China

^bKey Laboratory of Functional Inorganic Material Chemistry, Ministry of Education, School of Chemistry and Materials Science, Heilongjiang University, Harbin 150080, P. R. China

*Corresponding author.

Graphical abstract

The super-ionic conductivity nanowire Cu₂Se/Ni-foam electrode processes excellent cycling performance and the electrode is firstly assembled to asymmetric supercapacitor achieving high energy and power density.

Abstract

Transition metal selenide has stimulated much research interest in energy storage and conversion, due to its excellent electrical conductivity. β -Cu₂Se with special crystal structure is considered as super-ionic conductor, of which the diffusion coefficient is as large as a liquid. The fast ions and electrons conductor β -Cu₂Se with uniformly dense nanowire crossing with each other directly on nickel foam is prepared via simple one-step solvothermal grow method for 4h, avoiding conductive agent and binder. The feature much benefitting for electrons and ions transfer enable the β -Cu₂Se-4h electrode

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