Density controllable graphene aerogel for enhanced supercapacitor performance

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Abstract

As reported other articles, graphene hydrogel or aerogel could be fabricated using the hydrothermal synthesis [1, 2]. However, the fabricated graphene structure is composed by randomly aligned graphene and many pores. And utilizing this conventional synthesis method, the density and specific surface area could not be controlled.
In this article, we could fabricate density controllable graphene structure. Using various concentration and quantity of graphene oxide solution, graphene structures which have controllable densities of 10~35 mg/cm3 and BET surface area could be fabricated. Also, fabricated structure could be controlled of mechanical and electrical characteristics.
Because the fabricated graphene structure contains plenty of micro-pores, it is applied to an electrode of supercapacitor.
Due to control of density in graphene aerogel, we could manufacture supercapacitors which have various properties of specific capacitance.

References

[1] Yan Wang, Yingpeng Wu, Yi Huang, Fan Zhang, Xi Yang, Yanfeng Ma, and Yongsheng Chen, J. Phys. Chem. C 2011, 115, 23192

[2] Yuxi Xu, kaixuan Sheng, Chun Li and Gaoquan Shi, ACS Nano, 2010, 4, 4324.

Figures

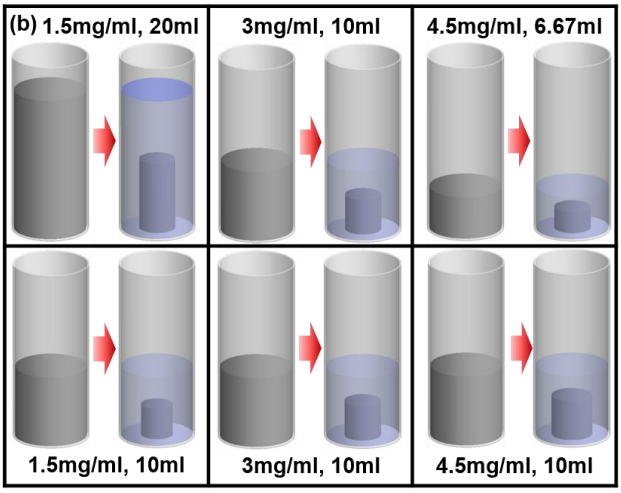

Figure 1: Schematic for density control of graphene aerogel

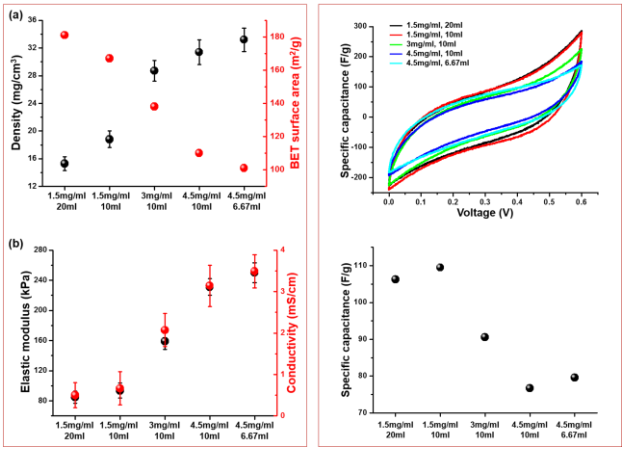

Figure 2: Property of graphene aerogel