SM-P006

Synthesis of Graphene Oxide Based CuOx Nanocomposites and Application for C-N Cross Coupling Reaction

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Graphene has attracted an increasing attention due to its extraordinary electronic, mechanical, and thermal properties. Especially, the two dimensional (2D) sheet of graphene with an extremely high surface to volume ratio has a great potential in the preparation of multifunctional nanomaterials, as 2D supports to host metal nanoparticles (NPs). Copper oxide is widely used in various areas as antifouling paint, p-type semiconductor, dry cell batteries, and catalysts. Although the copper oxide(II) has been well known for efficient catalyst in C-N cross-coupling reaction, copper oxide(I) has not been highlighted. In this research, CuO and Cu2O nanoparticles (NPs) dispersed on the surface of grapehene oxide (GO) have been synthesized by impregnation method and their morphological and electronic structures have been systemically investigated using TEM, XRD, and XAFS. We demonstrate that both CuO and Cu2O on graphene presents efficient catalytic performance toward C-N cross coupling reaction. The detailed structural difference between CuO and Cu2O NPs and their effect on catalytic performance are discussed.

Keywords: CuO, Cu2O, copper oxide, graphene

SM-P007

Soft Lithographic Patterning Method for Flexible Graphene-based Chemical Sensors with Heaters

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In this work, we demonstrated that the fabrication of flexible graphene-based chemical sensor with heaters by soft lithographic patterning method [1]. First, monolayer and multilayer graphene were prepared by thermal chemical vapor deposition transferred onto SiO2 / Si substrate in order to fabrication of patterned-sensor and -heater. Second, patterned-monolayer and multilayer graphene were detached through soft lithography process, which was transferred on top and bottom sides of PET film. Third, Au / Ti (Thickness : 100/30 nm) electrodes were deposited end of the patterned-graphene line by sputtering system. Finally, we measured sensor properties through injection of NO2 and CO2 gas on different temperature with voltage change of graphene heater.

Reference

[1] Kim H S, Jung M W, Myung S, Jung D S, Lee S S, Kong K J, Lim J S, Lee J H, Park C Y and An K S 2013 Soft lithography of graphene sheets via surface energy modification J. Mater. Chem. C. 1 1076.

Keywords: Graphene, Sensor, Heater