Electronic Supplementary Information (ESI)

Fabrication of reduced graphene oxide/metal (Cu, Ni, Co) nanoparticle hybrid composites via a facile thermal reduction method

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Experimental Procedures

Synthesis

Graphene oxide was prepared according to the Hummers' method in our previous report.[1] Quantitative amount of resulted graphene oxide was dissolved in 80 mL of deionized water by ultrasound, then metal nitrate ($Cu(NO_3)_2 \cdot 2.5H_2O$, $Ni(NO_3)_2 \cdot 6H_2O$, $Co(NO_3)_2 \cdot 6H_2O$) with certain amount was added into the above GO solution. After stirring for 18 hours, 1 M NaOH solution was dropped into the beaker for adjusting the pH to 11. After further stirring for 2 hours, the suspension was centrifugated and washed with deionized water for several times, and the resulted gunk was dried at 60 ^oC in the oven before calcined at 500 ^oC for 90 min under flowing Ar. The resulted composites were referred to rGO/Cu-x-y, rGO/Ni-x-y, or rGO/CoO-x-y, in which x-y is the mass ratio of GO to metal nitrate precursors.

Characterization

Structures of all samples were characterized by X-ray powder diffraction (XRD) on a PANalytical Empyrean Reflection Diffractometer with Cu Kα irradiation (λ = 0.15418 nm). HRTEM images and TEM elemental mapping of samples were observed on a JEOL JSM-2011 Transmission Electron Microscopy (TEM) with an acceleration voltage of 200 kV. The morphologies of all samples were observed on a JEOL JSM-6700 Field Scanning Electron Microscopy (FESEM). The surface group change in the as-prepared samples were identified by Fourier transform infrared spectroscopy (FT-IR) on IRAffinity-1S (SHIMADZU, Japan) with powder samples.

References

[1] Zhao, G.; Li, J.; Ren, X.; Chen, C.; Wang, X. *Environ. Sci. Technol.* **2011**, *45*, 10454.