Electronic Supplementary Information

Synthesis and Characterization 1D Co/$CoFe_2O_4$ Composites with Tunable Morphologies

Lijun Zhao, Hongjie Zhang,* Liang Zhou, Yan Xing, Shuyan Song and Yongqian Lei

State Key Laboratory of Rare Earth Resource Utilizations

Changchun Institute of Applied Chemistry Chinese Academy of Sciences

E-mail: hongjie@ciac.jl.cn

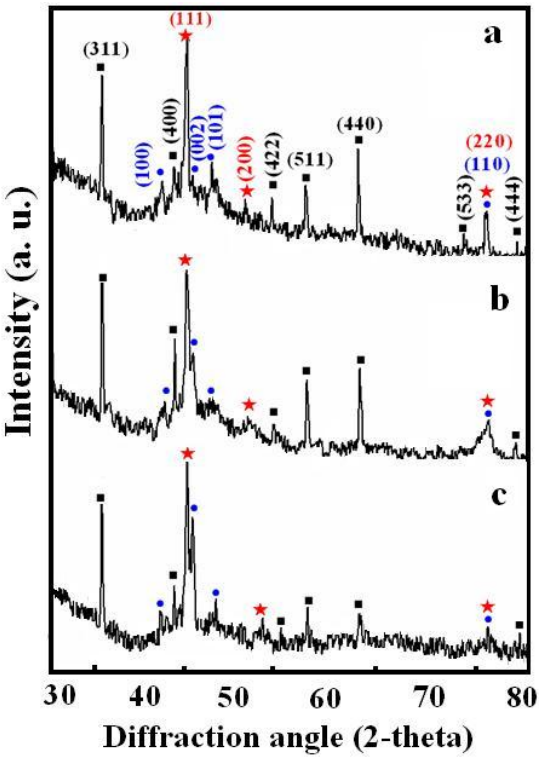

Figure S1 XRD patterns of Co/$CoFe_2O_4$ composites obtained with different NaOH quantities: (a) 2 g, (b) 3 g, and (c) 4 g. Black squares represent $CoFe_2O_4$ ferrite; blue spheres indicate Co metal with hexagonal packed structure; red pentagrams show Co metal with face-centered cubic structure.

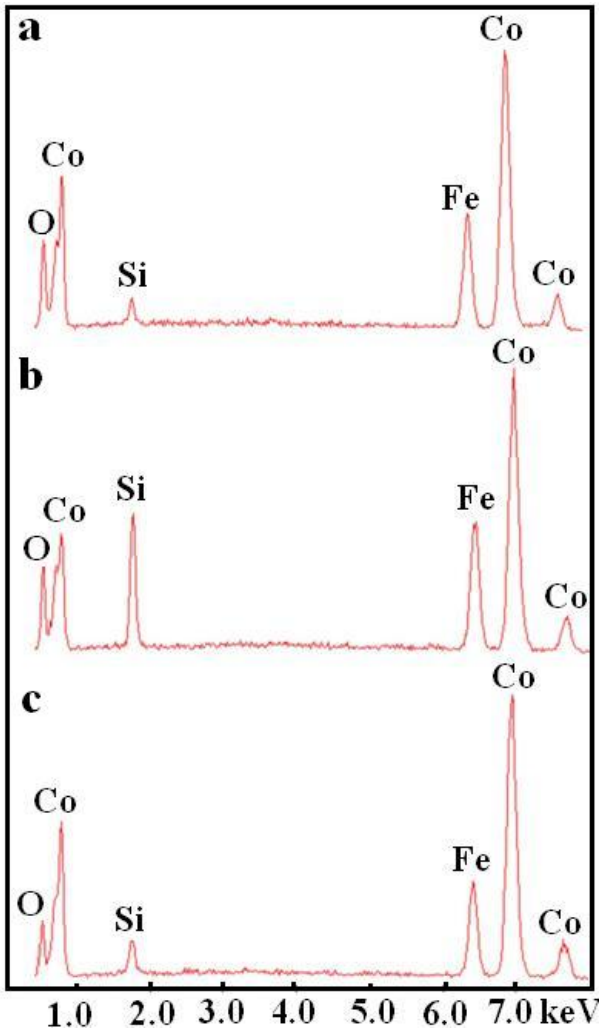

Figure S2 Energy dispersive X-ray spectroscopy (EDX) of Co/$CoFe_2O_4$ composites synthesized with different NaOH quantities: (a) 2 g, (b) 3 g, and (c) 4 g.

Details of Electrical Measurement.

The devices used in this investigation were fabricated by thermal evaporation in vacuum onto indium tin oxide (ITO) glass substrates with the sheet resistance of 25 Ω/ sq. All the organics were evaporated with the rate of 0.05 nm/ s under high vacuum (5×10^{-5} Pa). LiF and Al were evaporated in another vacuum chamber (8.0×10^{-5} Pa) with the rates of 0.01 and 1 nm/s, respectively, without being exposed to the atmosphere. The thickness of these deposited layers and the evaporation rate of individual materials were monitored in vacuo with quartz crystal monitors.

The shape of the cathode was defined using a shadow mask during the deposition of Al. The active area of these devices as defined by the overlapping area of the cathode and the anode is 10 mm^2. After fabrication, all the devices were measured immediately in air at room temperature without encapsulation. Current density-voltage characteristics were measured by using a Keithley source measurement unit (Keithley 2400 and Keithley 2000) with a calibrated silicon photodiode.