Supporting Information for

Facile Synthesis of Metal-Organic Cobalt Hydroxide Nanorods Exhibiting a Reversible Structural Transition

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Supporting Information: Characterization.

Elemental analysis for cobalt was performed by inductively coupled plasma emission spectroscopy using a Shimadzu ICPS-7500 instrument on solutions prepared by dissolving samples in concentrated HNO_3. Carbon, hydrogen, and oxygen analyses were carried out using an Elementar vario MICRO cube instrument.

Powder X-ray diffraction (PXRD) patterns of the samples were recorded using a Shimadzu XRD-6000 diffractometer under the following conditions: 40 kV, 30 mA, Cu $K\alpha_1$ radiation (λ = 0.15406 nm). The samples were step-scanned in steps of 10 °/min in the 2θ range from 3 to 90°. The observed diffraction peaks were corrected using elemental Si as an internal standard. The samples were ground into powders before measurement.

Fourier transform infrared (FT-IR) spectra were recorded in the range 4000 to 400 cm^{-1} with 2 cm^{-1} resolution on a Bruker Vector-22 Fourier transform spectrometer using the KBr pellet technique (1 mg of sample in 100 mg of KBr).

Thermogravimetric analysis (TGA) was carried out using a Rigaku TG-8120 instrument in the temperature range 25–800 °C at a heating rate of 10 °C/min under a nitrogen flow.

Scanning electron microscope (SEM) images were obtained using a Hitachi S-4700 field emission SEM at 20 kV, with the surface of the samples coated with a thin platinum layer to avoid a charging effect.

Transmission electron microscopy (TEM) was performed on a Hitachi H-800 microscope with an accelerating voltage of 150 kV. The sample was ultrasonically dispersed in an appropriate amount of water and a drop of the resulting suspension was deposited on a carbon-coated Cu grid followed by evaporation of the solvent in air.

UV–visible diffuse reflectance spectra were recorded at room temperature in air on a Shimadzu UV-2450 spectrophotometer.

Supporting Information: Figures.

Fig. S1 EDX spectrum of Co(OH)(Hsal)·H_2O nanorods prepared at 70 ^oC.

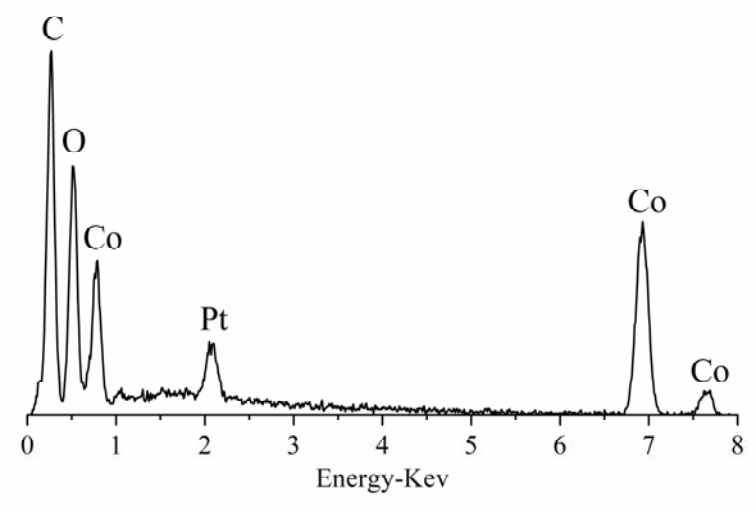

Fig. S2 EDX spectrum of Co(OH)(Hsal)·H_2O nanorods prepared at 30 ^oC.

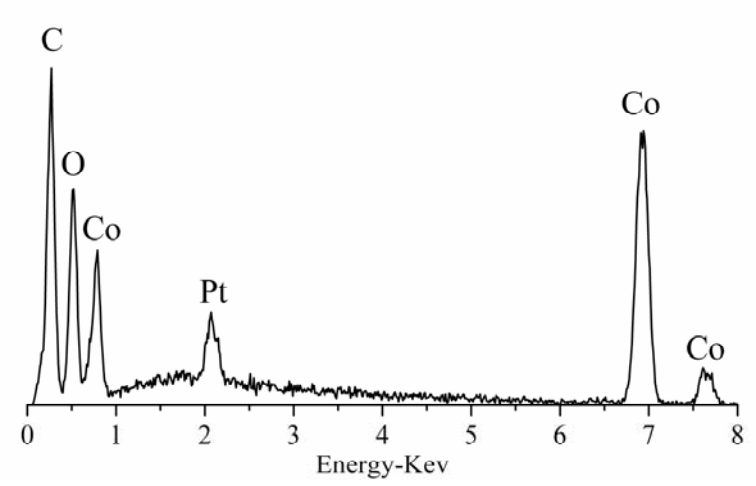

Fig. S3 Powder XRD patterns of Co(OH)(Hsal)·H_2O nanorods prepared at different temperatures: (a) 30 ^oC; (b) 70 ^oC; (c) 95 ^oC.

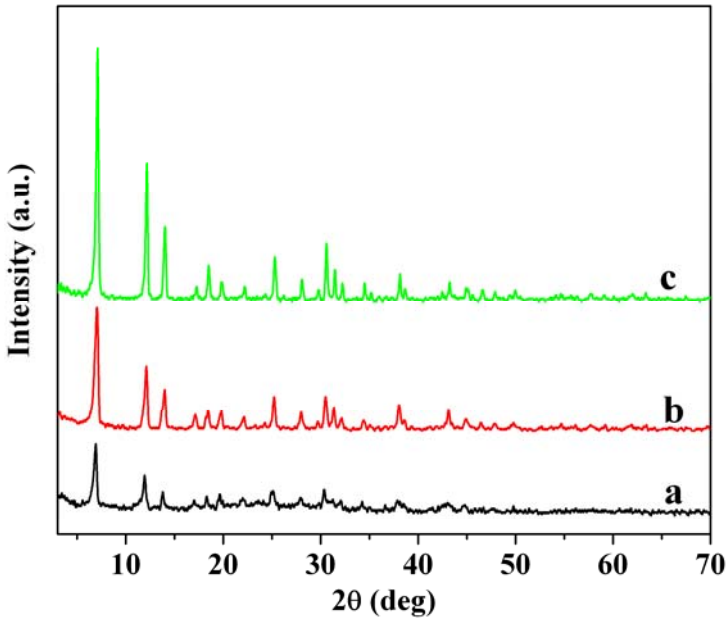

Fig. S4 FT-IR spectra of (a) sodium salicylate and (b) Co(OH)(Hsal)·H_2O nanorods.

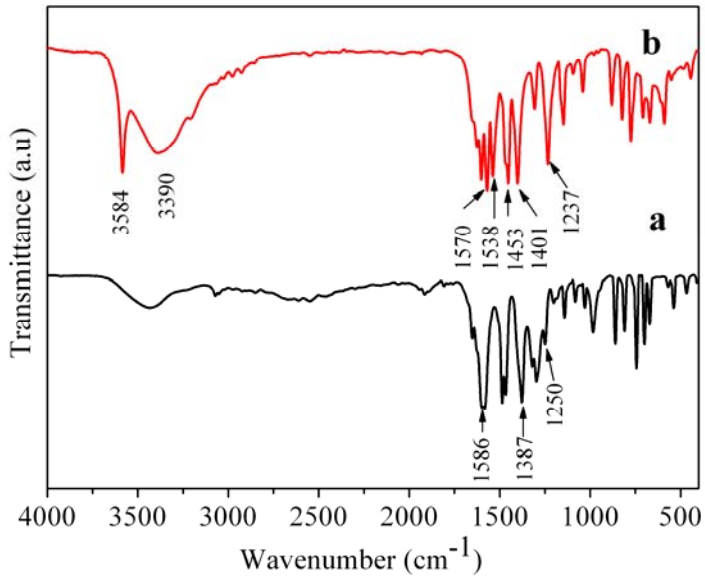

Fig. S5 PXRD patterns of (a) cobalt/carbon nanocomposites obtained by heating Co(OH)(Hsal)·H_2O nanorods in N_2 at 600 ^oC and (b) of the material obtained by treating (a) with 63% nitric acid solution.

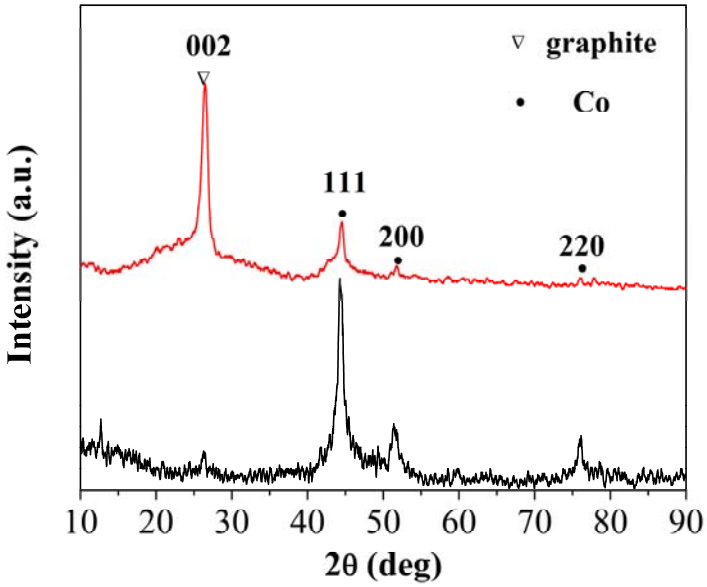

Fig. S6 UV–visible diffuse reflectance spectra of the nanorods dehydrated at 300 ^oC followed by treatment with water.

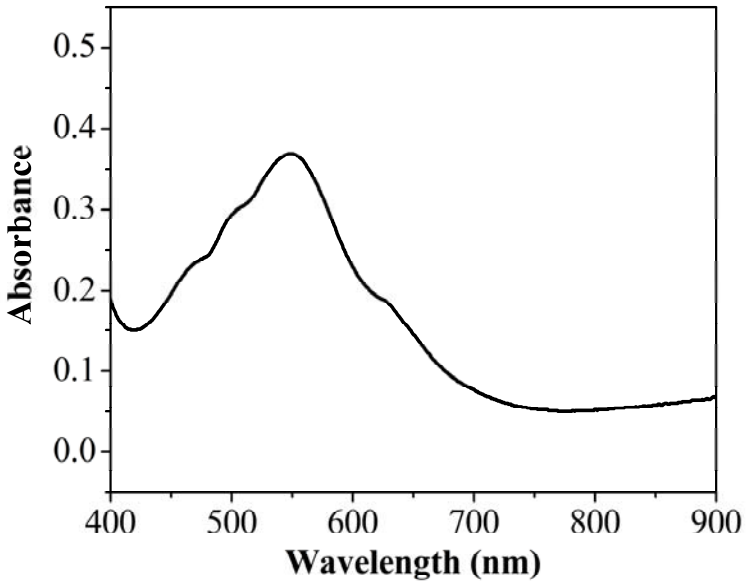

Fig. S7 TGA curve of the nanorods dehydrated at 300 °C followed by treatment with water.

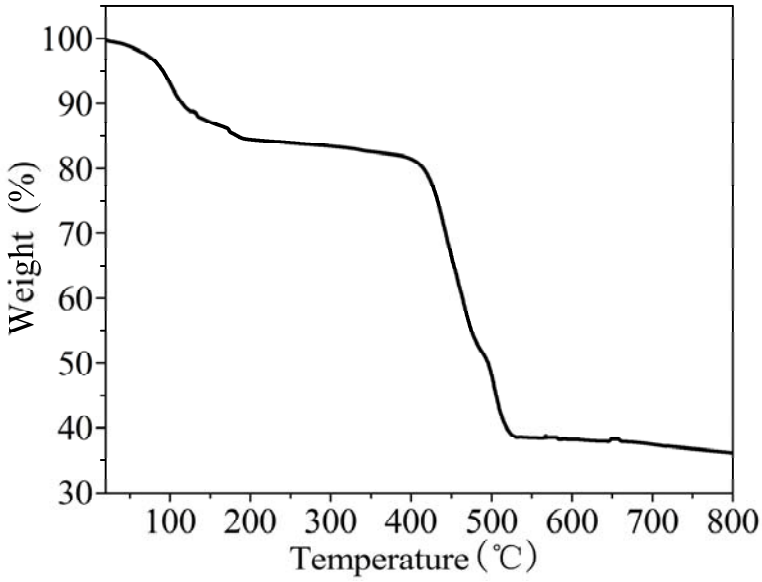

Fig. S8 SEM images of the nanorods dehydrated at 300 °C followed by treatment with water.

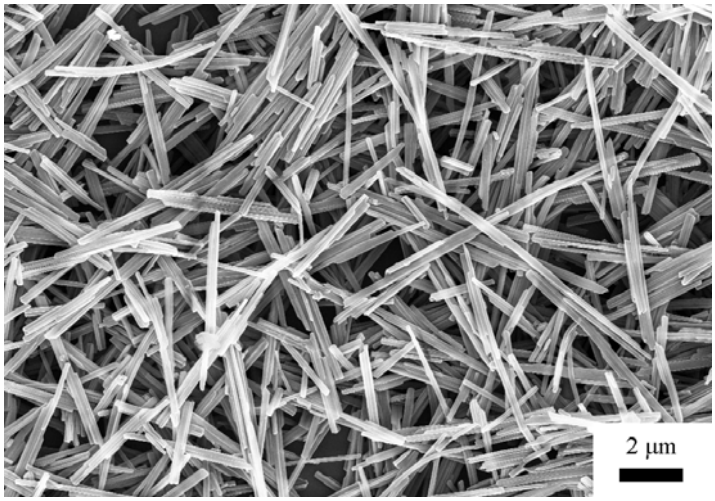

Fig. S9 FT-IR spectra of (a) the original Co(OH)(Hsal)·H_2O nanorods, (b) after heating at 300 ^oC, and (c) after treating the sample in (b) with water.