Supplementary Material for Chemical Communications

Electronic Supplementary Information for

Fabrication of hierarchical porous iron oxide films utilizing the Kirkendall effect

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Characterization procedures

Characterization: X-ray powder diffraction patterns were obtained on a Bruker D8 Advance X-ray diffractometer with Cu Kα radiation (λ = 1.54178 Å). Scanning electron microscopy images and energy dispersive X-ray spectrum were performed on a LEO 1450VP scanning electron microscope with an energy-dispersive X-ray instrument. Transmission electron microscopy images were recorded on a Tecnai 20 FEG transmission electron microscope. XPS measurements were performed in a VG Scientific ESCALAB Mark II spectrometer equipped with two ultrahigh-vacuum

(UHV) chambers. All binding energies were referenced to the C_{1S} peak at 284.8 eV of the surface adventitious carbon. The nitrogen adsorption and desorption isotherms of the resulting films on substrates at 77 K were measured using a Micromeritics ASAP2010 system after the film samples were vacuum-dried at 110 ^{o}C overnight.

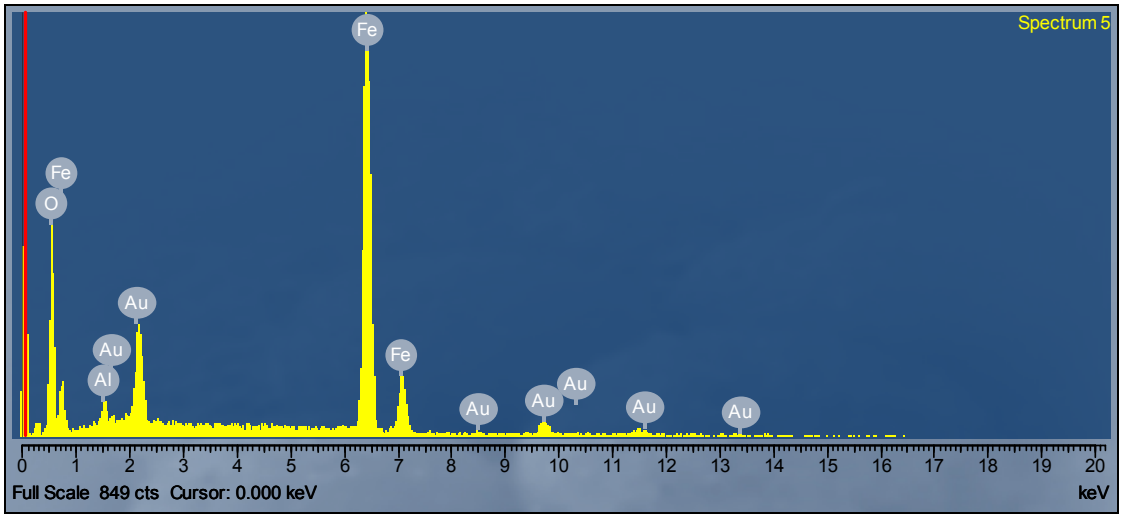

Figure S1 EDX spectra of the final iron oxide films.

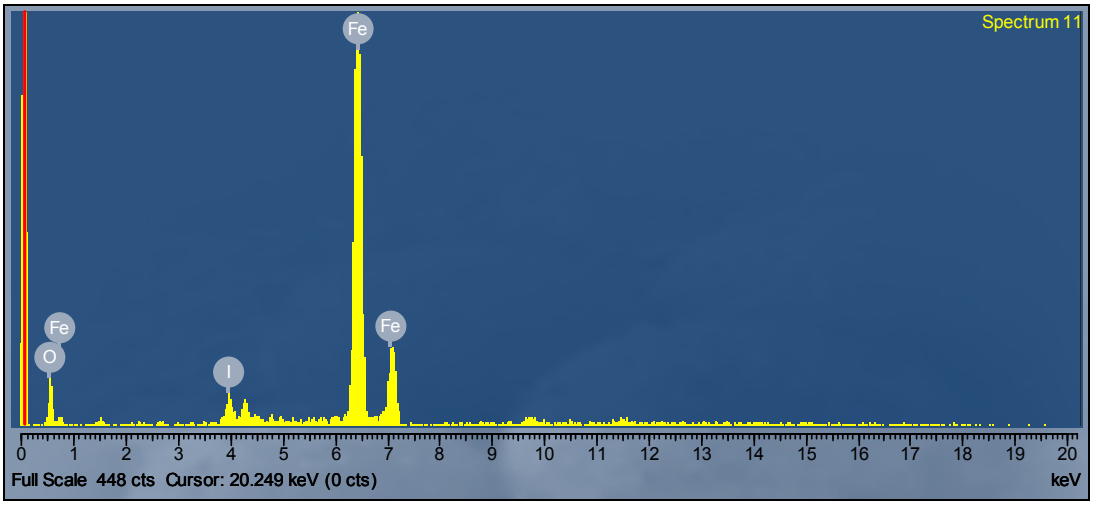

Figure S2 EDX spectra of the resulting film grown at early stages during hydrothermal reaction.

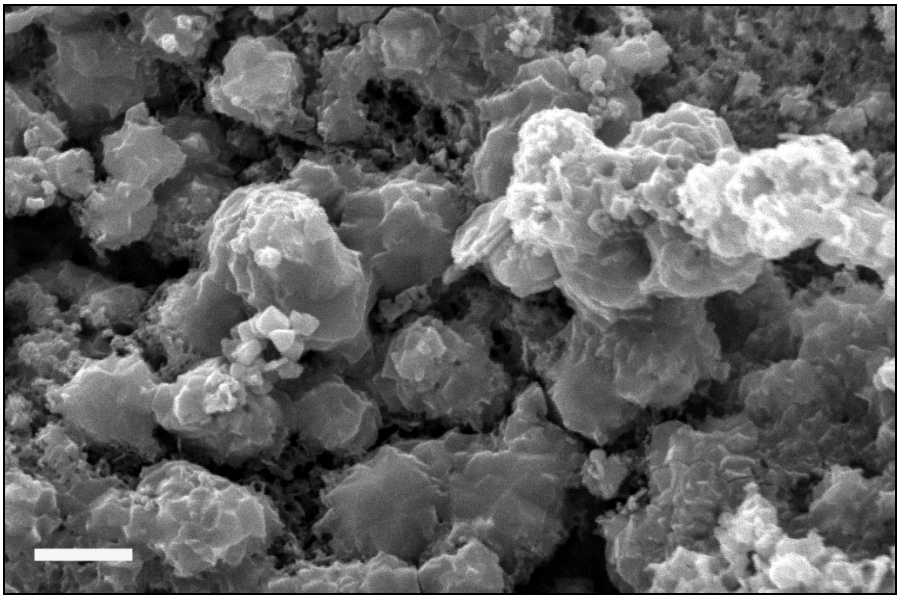

Figure S3 SEM image of the film grown in 15 mL water without addition of iodine at 180 ^{o}C for 12 h. Scale bar: 2 μm.

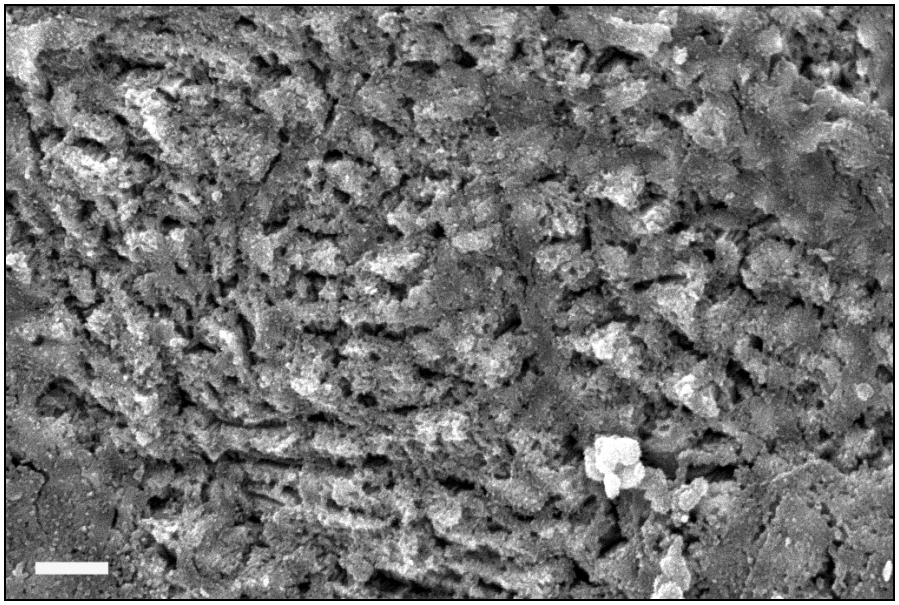

Figure S4 SEM image of the film grown in CTAB ethanolic solution (0.4 g CTAB in 15 mL water) without addition of iodine at 180 ^{o}C for 12 h. Scale bar: 2 μm.

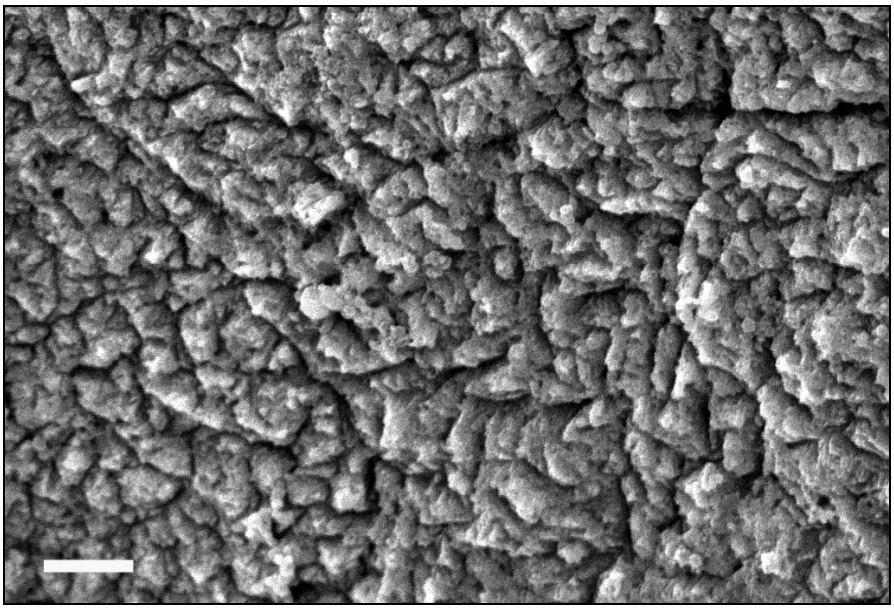

Figure S5 SEM image of the film grown in CTAB aqueous solution (0.4 g CTAB in 15 mL water) without addition of iodine at 180 ^{o}C for 12 h. Scale bar: 2 μm.

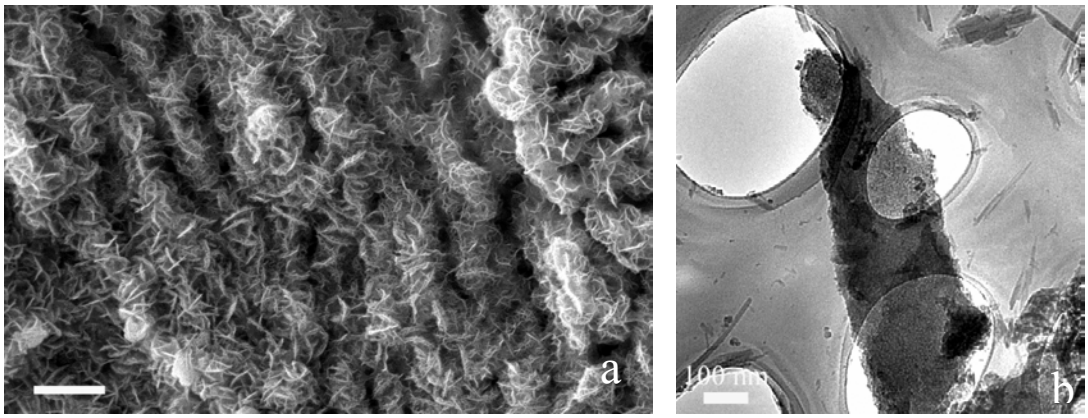

Figure S6 SEM and TEM images of the resulting cobalt oxide film. a): SEM, b) TEM. Scale bar in a: 2 μm.