Supporting Information

Co_3O_4@(Fe-doped)$Co(OH)_2$ Microfibers: Facile Synthesis, Oriented-assembly, Formation Mechanism and High Electrocatalytic Activity

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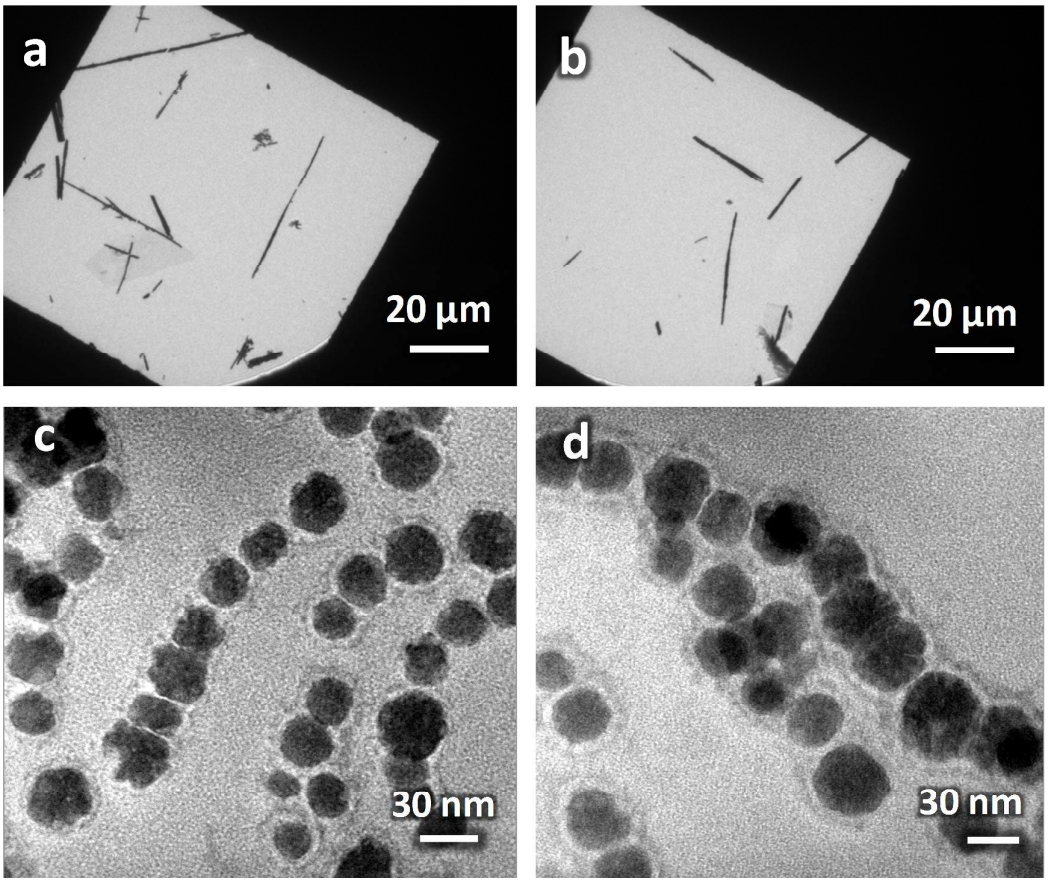

Figure. S1. (a,b,c,d) TEM images of one dimensional assembly of Co_3O_4 nanoparticles (with different magnifications).

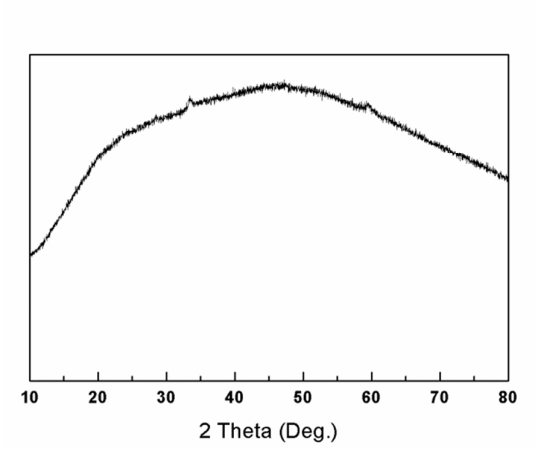

Figure S2. XRD pattern of the chain-like assemblage of Co_3O_4 NPs which indicates very poor crystallinity. Only two weak peaks at 33.3^o and 59.5^o could be identified, which are ascribed to α-$Co(OH)_2$ and Co_3O_4 nanocrystals, respectively.

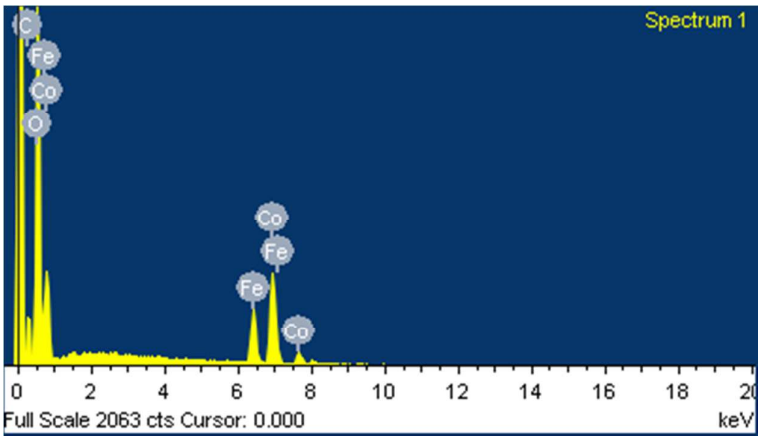

Figure S3. EDX spectrum of the Co_3O_4@Fe-$Co(OH)_2$, which shows the presence of Co, Fe and O elements.

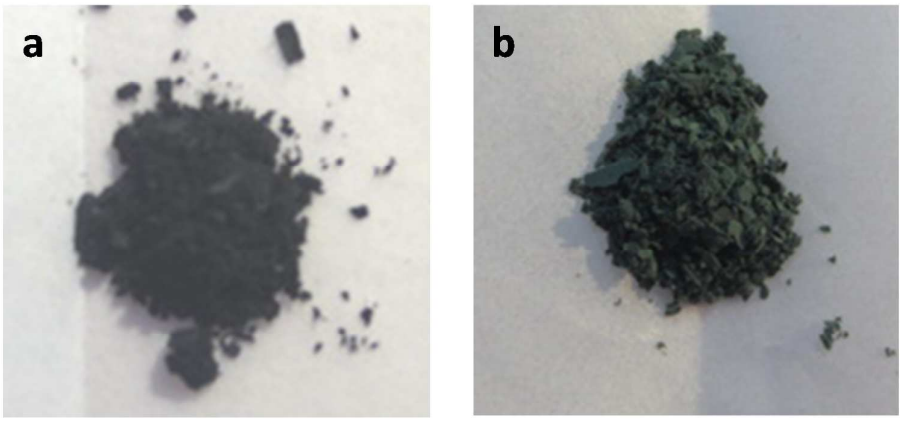

Fig. S4. A control experiment to demonstrate the role of SDBS in the formation of the chain-like assemblages of Co_3O_4 NPs: (a) with the presence of SDBS; (b) without the addition of SDBS. Note that sample a is black in color, whereas sample b prepared without the presence of SDBS was grey green in color, clearly showing the affluent presence of $Co(OH)_2$ species. Such comparative result indicates the role of SDBS in inhibiting the formation of $Co(OH)_2$ during the process.

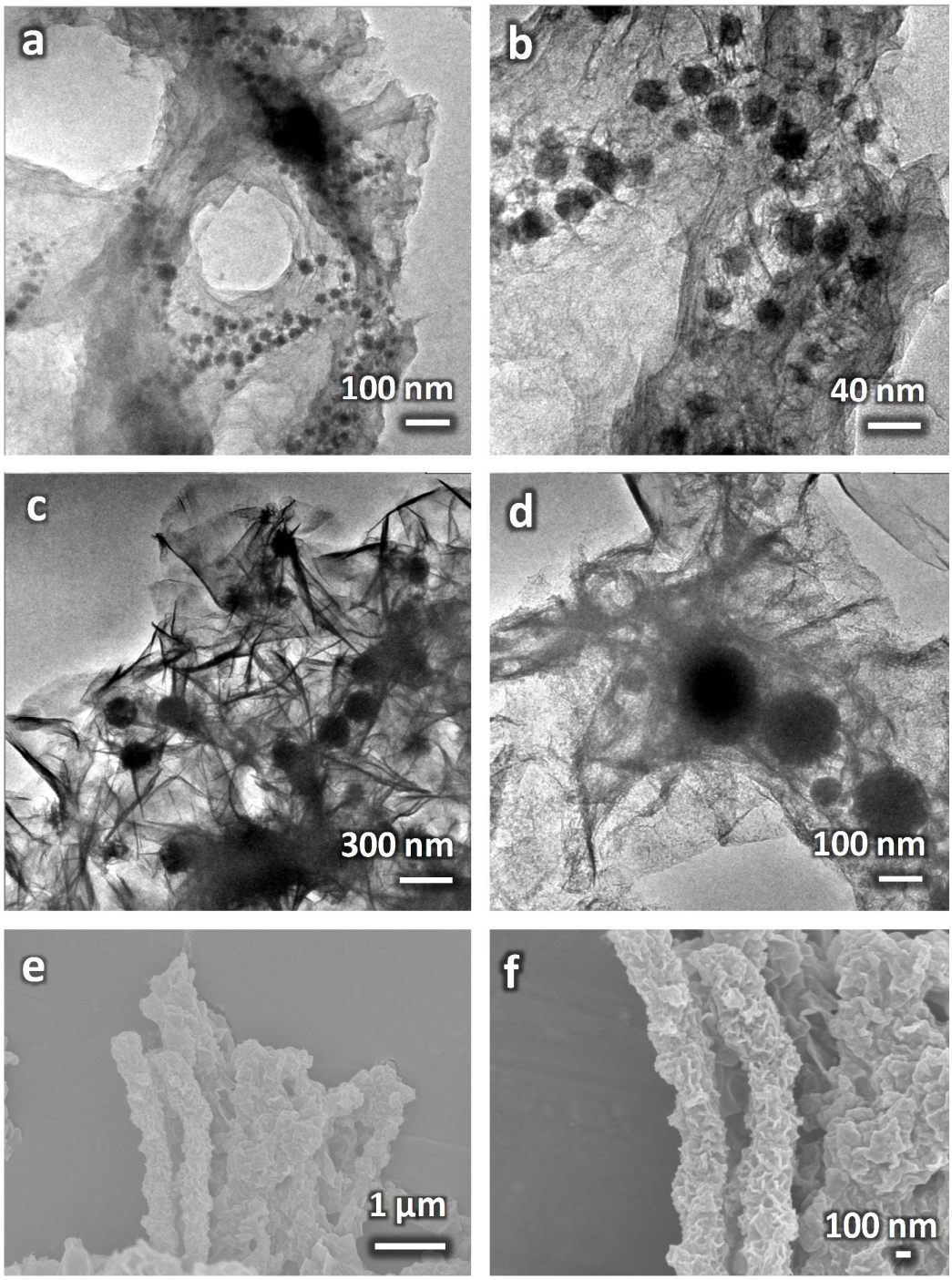

Figure S5. TEM images of: (a,b) the endproduct formed without the presence of the cylindrical magnet; (c,d) the endproduct formed when deionized water was used instead of the PVP aqueous solution; (e,f) the endproduct formed when a PVP concentration of 5% was employed. Note that other conditions are the same as those in the main text.

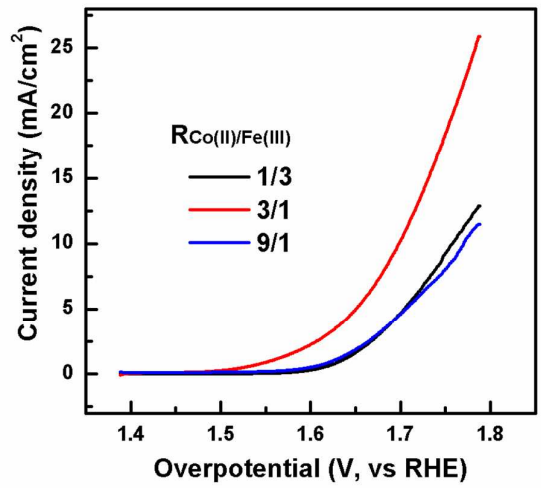

Figure S6. OER catalytic performance of the samples prepared using different ratios of Co(II) to Fe(III) in the precursor solution. Note that the samples were prepared using the conditions depicted in section 2.4 and the total mole of Co(II) and Fe(III) was maintained the same. The OER testing conditions: 0.1 M KOH, scan rate 5 mV/s.

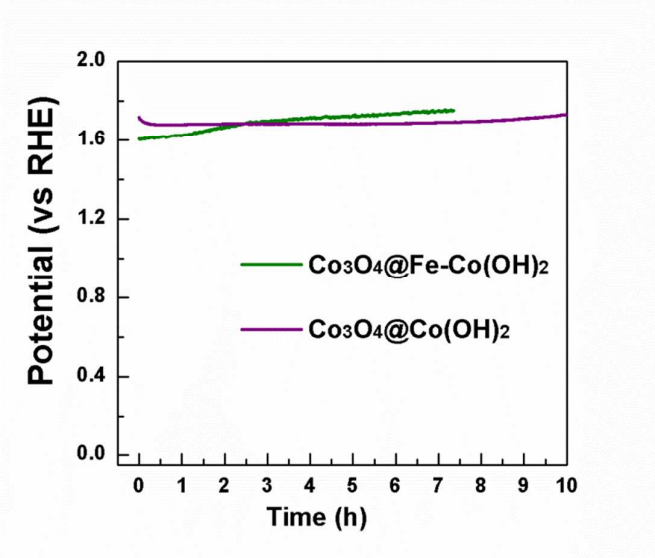

Figure S7. Durability test of the Co_3O_4@(Fe-doped)$Co(OH)_2$ microfibers in 0.1 M KOH by following the potential changes as a function of time at a current density of 10 mA/cm^2. The data was not iR-compensated.