Supplementary Material (ESI) for Chemical Communications

Tubular FeCo bimetallic nanostructure using a cellulose/cobalt hexacyanoferrate composite as a precursor

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Electronic Supplementary Information

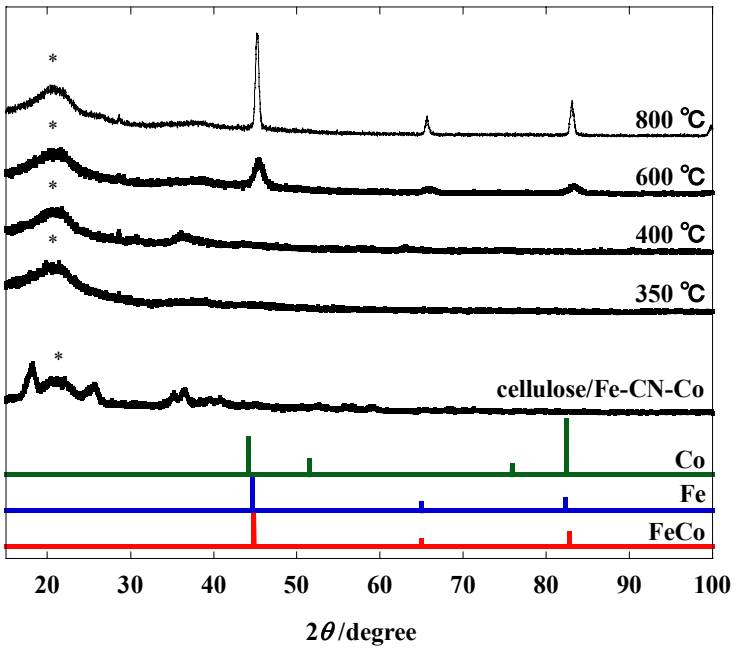

Fig. S1. XRD patterns of the cellulose/Fe-CN-Co composite material (n = 12) before and after the calcination under H_2 at 350°C, 400°C, 600°C, and 800°C with the JCPDS data of Co, Fe, and FeCo. The broad peaks marked by asterisks were assigned to the cellulose fibre before and after the calcinations.

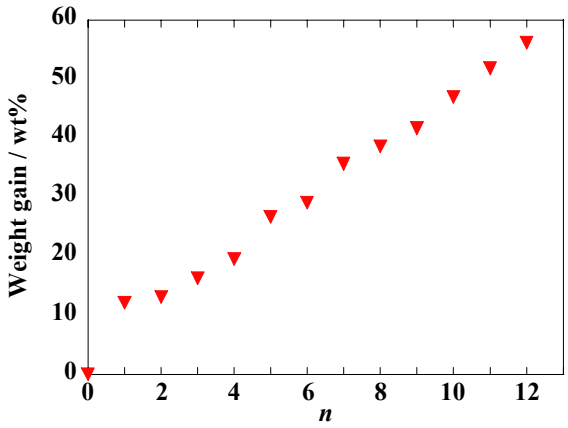

Fig. S2. Relation between the number of *n* and the weight increase of the cellulose/Fe-CN-Co composite material.

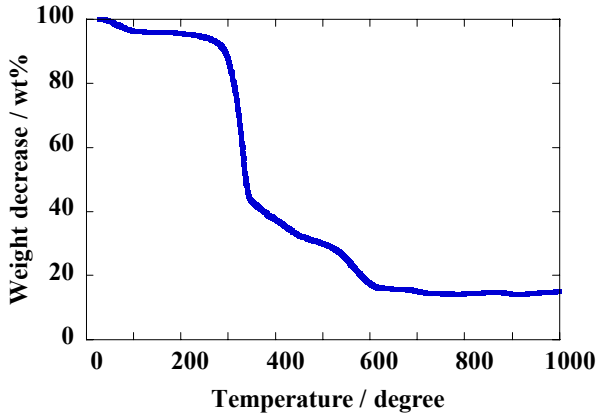

Fig. S3. TGA curve of the cellulose/Fe-CN-Co composite material (*n* = 12) in a H_2 atmosphere (N_2/H_2 = 30 mL min^{-1}/300 mL min^{-1}). The temperature was raised at a rate of 2ºC min^{-1}.

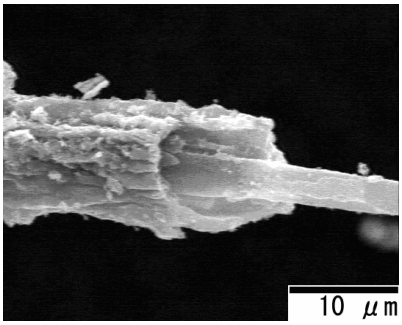

Fig. S4. SEM image of the cellulose/Fe-CN-Co composite material (n = 12) calcined at 600ºC in a H_2 atmosphere.

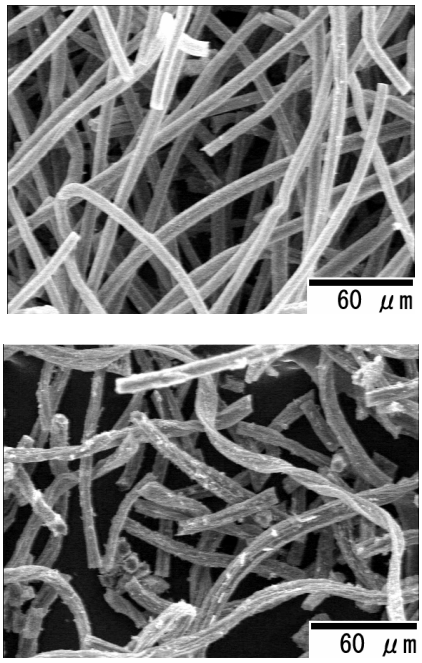

Fig. S5. SEM image of the cellulose/Fe-CN-Co composite material [n = 1 (top), 6(bottom)] calcined at 600ºC in a H_2 atmosphere.

Analyses of XRD from the Scherrer's equation:

For the crystal size of cellulose/Fe-Cn-Fe composite (n = 12):

8.4 nm calculated from the peak at 17.86º (200)
8.8 nm from 24.72º (220)
9.5 nm from 35.18º (400)

Averave: 8.9 nm, Standard deviation: 0.5 nm

For the crystal size of FeCo tubular material:

8.6 nm calculated from the peak at 45.56º (110)
9.0 nm from 83.36º (200)
9.4 nm from 83.1º (211)

Averave: 9.0 nm, Standard deviation: 0.3 nm