Supporting Information:

**Hexagonal CoOOH nanoflakes synthesized from three-dimensional cellulose membrane matrix with enhanced detection of ascorbic acid**

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**Preparation of pure CoOOH nanoflakes and cellulose membrane**

The pure CoOOH nanoflakes were fabricated by a simple redox method

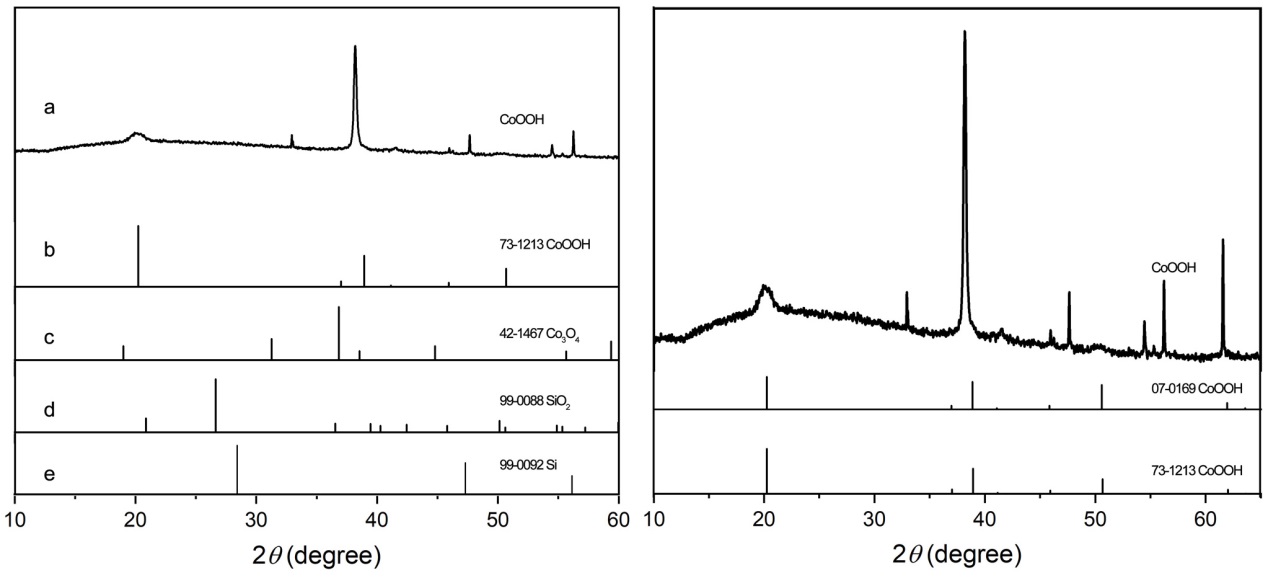
Briefly, 6.25 mL of NaOH (1 M) and 1.275 mL NaClO (0.2 M) were added into 25 mL CoCl2 solution (10 mM) with vigorous stirring, and then the mixture was sonicated for 30 min. After that, CoOOH nanoflakes were collected from the suspension by centrifugation at 1000 rpm for 5 min. Finally, the nanoflakes were washed three times with deionized water.

The pure cellulose membrane was fabricated by a simple casting method.

Briefly, 14g NaOH, 24 g urea and 162 mL H2O were pre-cool to -12.5 oC, and then 6 g cotton linter was added into the NaOH/urea solution with vigorous stirring for 5 min. After that, the dissolved cellulose solution were centrifugated at 4000 rpm for 5 min to eliminate the bubble, and the regenerated cellulose membrane was fabricated by a simple casting method. Finally, the regenerated cellulose membrane was washed three times with deionized water.

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**Figure S1.** FT-IR spectra of CoOOH, cotton linter, CM, CCM and CCM-AA

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**Figure S2.** XRD patterns of pure CoOOH nanoflakes under silicon wafer as substrate (left), and right was the enlarge image of CoOOH nanoflakes.

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**Figure S3.** Digital images of CoOOH nanoflakes (a) and CCM (b) upon adding TMB solution, respectively.

**Table S1.** Element content of pure CoOOH nanoflakes by EDS

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Element | Line type | Wt% | Wt% sigma | At% |
| Co | K | 35.92 | 0.19 | 67.37 |
| O | K | 64.08 | 0.19 | 32.63 |

**Table S2.** Element content of CM, CCM and CCM-AA by XPS

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Type | Atom | | | |
|  | C | O | Co |
| CM | Atom ratio (%) | 52.90 | 47.10 | 0.00 |
| CCM | 66.26 | 33.18 | 0.56 |
| CCM-AA-1 | 60.15 | 39.64 | 0.21 |
| CCM-AA-2 | 57.78 | 42.03 | 0.19 |
| CCM-AA-3 | 57.44 | 42.40 | 0.16 |

CCM-AA-1: the concentration of AA solution is 0 μM; CCM-AA-2: the concentration of AA solution is 15 μM; CCM-AA-3: the concentration of AA solution is 100 μM.

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