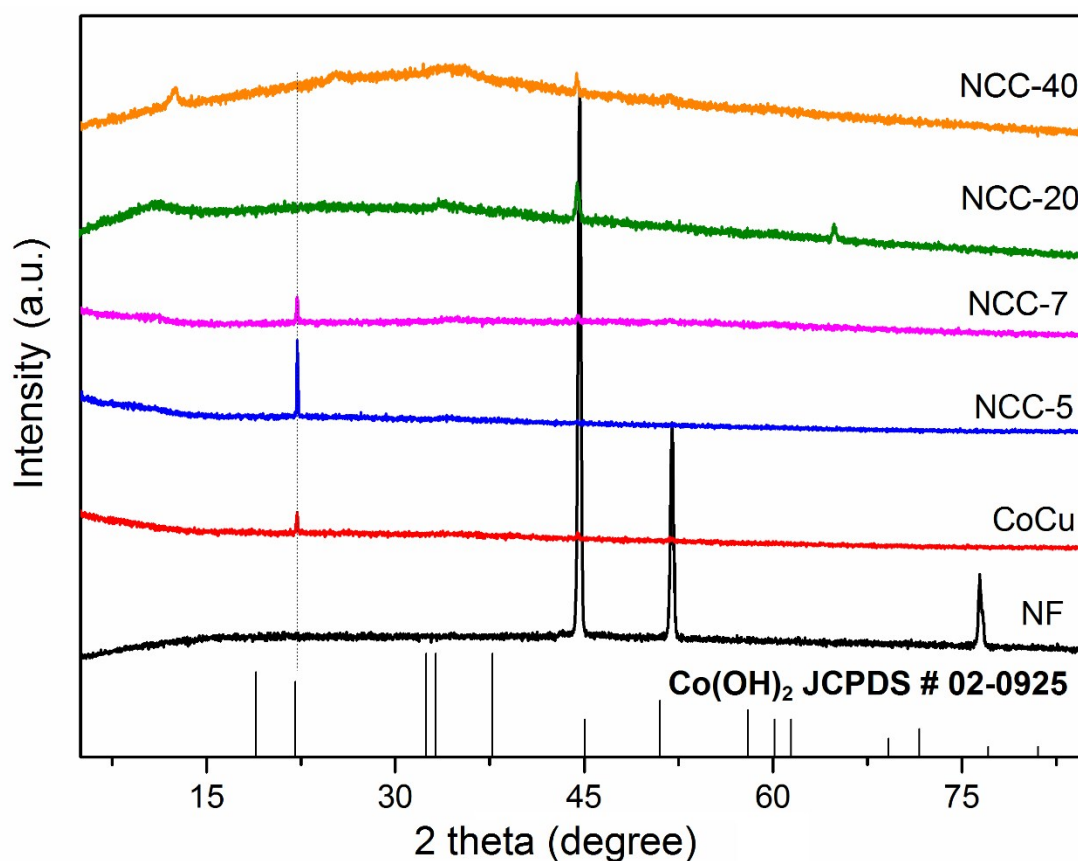


## Supporting Information

### Novel CuO-Cu<sub>2</sub>O redox induced self-assembly hierarchical NiOOH@CuO-Cu<sub>2</sub>O/Co(OH)<sub>2</sub> nanocomposite for efficient oxygen evolution reaction

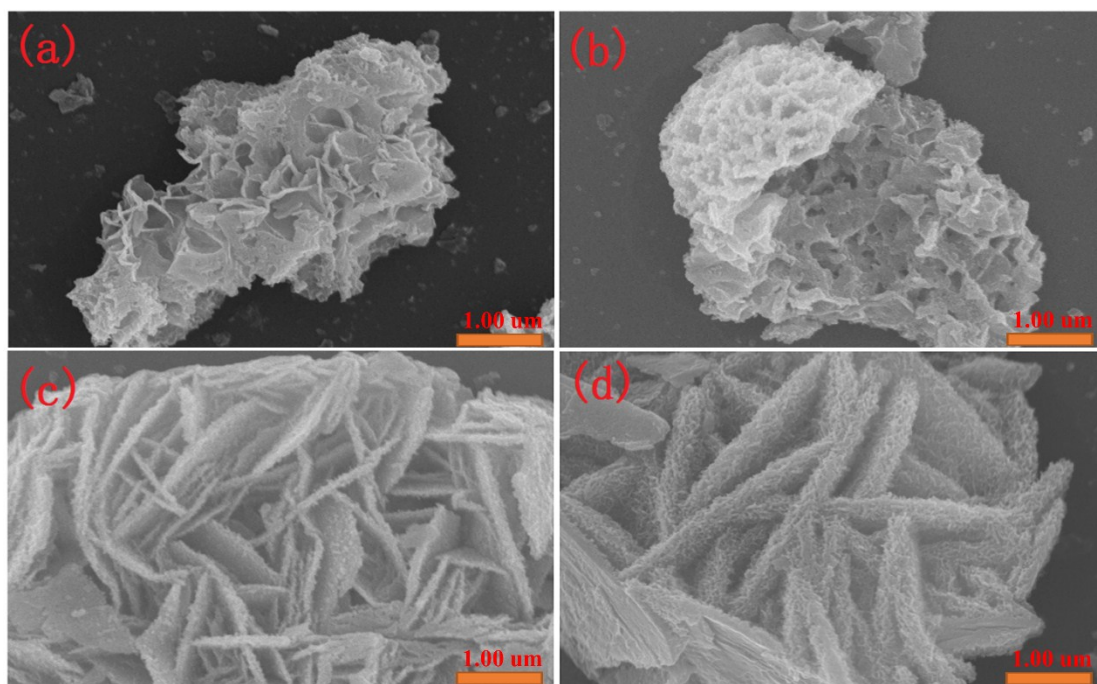
Yawen Li, Guifang Li, Jialing Xu, Lishan Jia\*

Department of Chemical and Biochemical Engineering, College of Chemistry and  
Chemical Engineering, Xiamen University, Xiamen 361005, Fujian, China

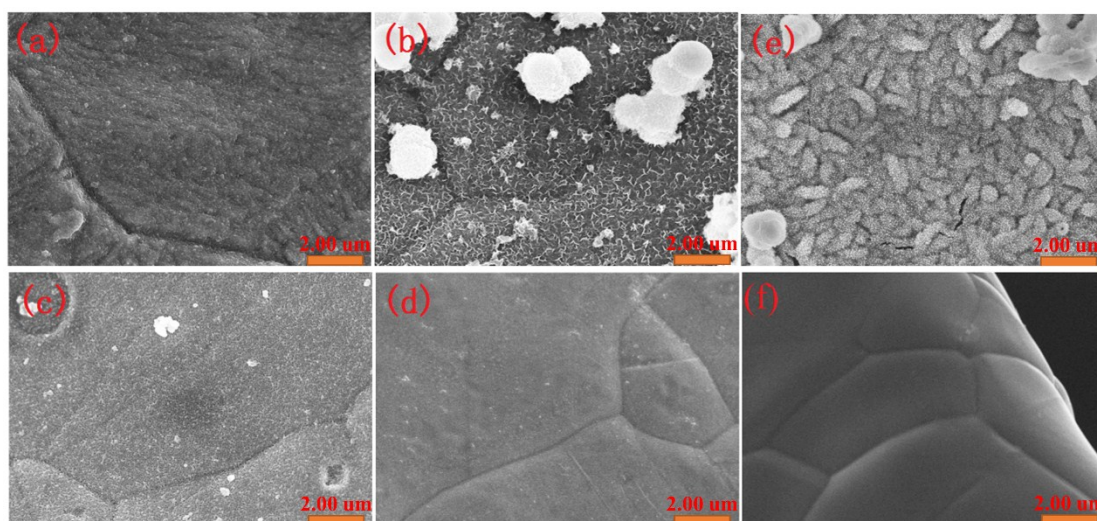


**Fig. S1.** XRD of NF, CoCu, NCC-5, NCC-7, NCC-20 and NCC-40 samples.

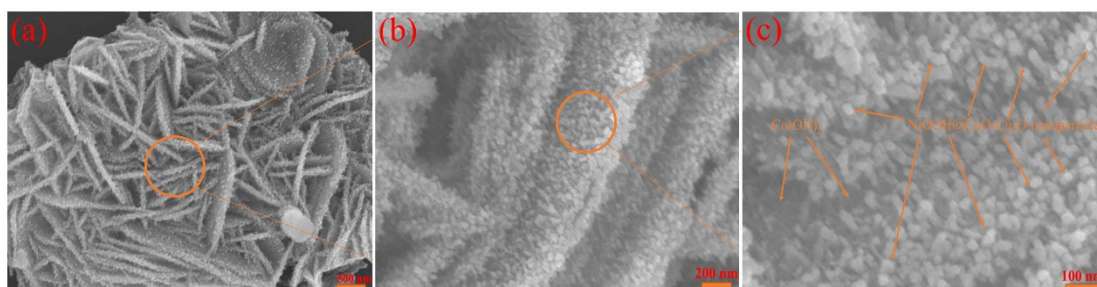
\* Correspondence: Lishan Jia, E-mail: jials@xmu.edu.cn



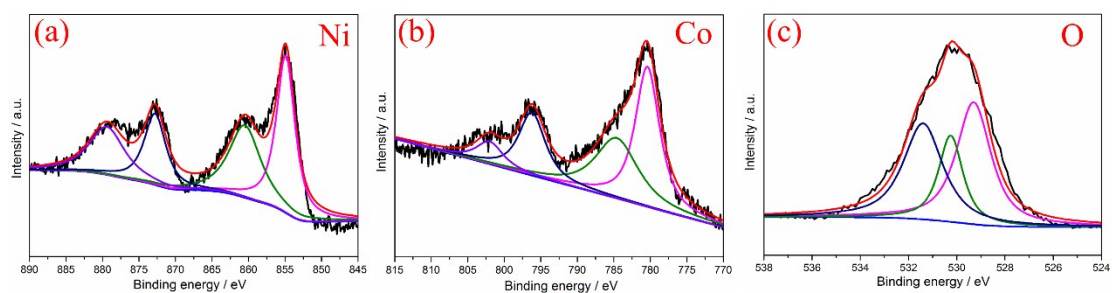
**Fig. S2.** SEM photos of (a) NC, (b) NCC-10, (c) NCC-30 and (d) NCC-50 after ultrasonic.



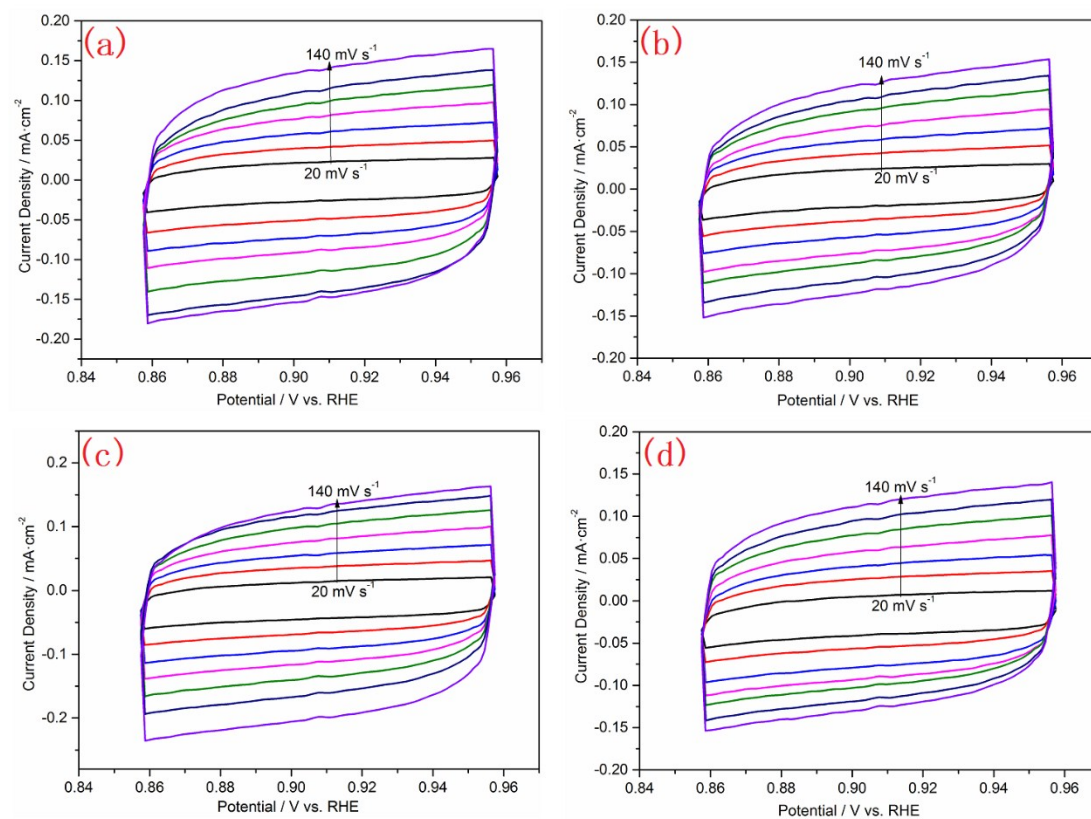
**Fig. S3.** SEM images of (a) Ni, (b) Co, (c) Cu, (d) NiCu, (e) CoCu and (f) Nickle foam.



**Fig. S4.** The stepwise enlargement SEM images of NCC-30 sample.



**Fig. S5.** Ni, Co and Cu XPS spectra of sample NC.



**Fig. S6.** CV plots in different scan rates of sample NCC-30.

**Table S1.** OER stability of NiOOH@CuO-Cu<sub>2</sub>O/Co(OH)<sub>2</sub> and other similar electrocatalysts

| Catalyst                                     | Current density (mA/cm <sup>2</sup> ) | Testing time (h) | Ref.      |
|----------------------------------------------|---------------------------------------|------------------|-----------|
| CoNi-CuHP                                    | 10                                    | 45               | 1         |
| Ni-Cu-P                                      | 10                                    | 30               | 2         |
| CoNi-NDC/PANI-NF                             | 10                                    | 20               | 3         |
|                                              | 100                                   | 20               |           |
| Co(OH) <sub>2</sub> @Ni(OH) <sub>2</sub> /CC | 10                                    | 10               | 4         |
| CuCo <sub>2</sub> S <sub>4</sub>             | 10                                    | 12               | 5         |
| CuO-NiO/NF                                   | 15                                    | 10               | 6         |
| MWCNT/CuO-400                                | 10                                    | ~22              | 7         |
| Co-CuO NA/CF                                 | 50                                    | 15               | 8         |
| NiOOH@CuO-                                   | 20                                    | 48               | This work |
| Cu <sub>2</sub> O/Co(OH) <sub>2</sub>        | 50                                    | 15               |           |

## References

- 1 Y. Zhang, T. T. Qu, F. F. Bi, P. P. Hao, M. H. Li, S. Y. Chen, X. K. Guo, M. J. Xie and X. F. Guo, *Acs Sustain Chem Eng*, 2018, **6**, 16859-16866.
- 2 B. K. Kim, S. K. Kim, S. K. Cho and J. J. Kim, *Appl Catal B-Environ*, 2018, **237**, 409-415.
- 3 W. J. Dang, Y. Q. Shen, M. Lin, H. Jiao, L. Xu and Z. L. Wang, *J Alloy Compd*, 2019, **792**, 69-76.
- 4 Y. L. Wang, Y. X. He and M. Zhou, *Appl Surf Sci*, 2019, **479**, 1270-1276.
- 5 M. Chauhan, K. P. Reddy, C. S. Gopinath and S. Deka, *Acs Catal*, 2017, **7**, 5871-5879.
- 6 C. J. Li, B. Zhang, Y. Li, S. J. Hao, X. Cao, G. Yang, J. S. Wu and Y. Z. Huang, *Appl Catal B-Environ*, 2019, 244, 56-62.
- 7 A. Chinnappan, D. X. Ji, C. Baskar, X. H. Qin and S. Ramakrishna, *J Alloy Compd*, 2018, **735**, 2311-2317.

- 8 X. L. Xiong, C. You, Z. Liu, A. M. Asiri and X. P. Sun, *Acs Sustain Chem Eng*, 2018, **6**, 2883-2887.