

Supporting Information

In-situ sulfurized CoMoS/CoMoO₄ shell-core nanorods supported on N-doped reduced graphene oxide (NRGO) as efficient electrocatalyst for hydrogen evolution reaction

Yan-Ru Liu ^a, Xiao Shang ^a, Wen-Kun Gao ^{a,b}, Bin Dong^{*a,b}, Xiao Li ^a, Xue-Hui Li ^a,

Jin-Chong Zhao ^a, Yong-Ming Chai ^a, Yun-Qi Liu^{*a}, Chen-Guang Liu ^a

a State Key Laboratory of Heavy Oil Processing, China University of Petroleum (East China),

Qingdao 266580, PR China

b College of Science, China University of Petroleum (East China), Qingdao 266580, PR China

* Corresponding author. Email: dongbin@upc.edu.cn (B. Dong), liuyq@upc.edu.cn (Y.Q Liu)

Tel: +86-532-86981376, Fax: +86-532-86981787

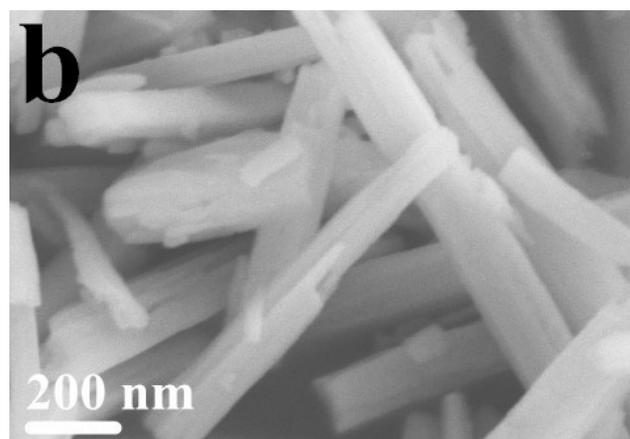
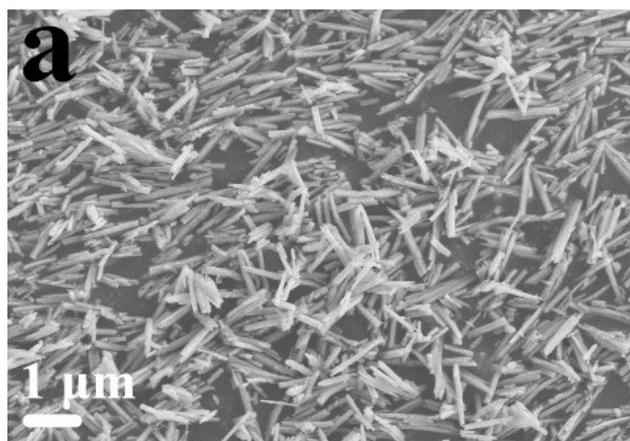


Figure S1. SEM images of CoMoO₄ nanorods.

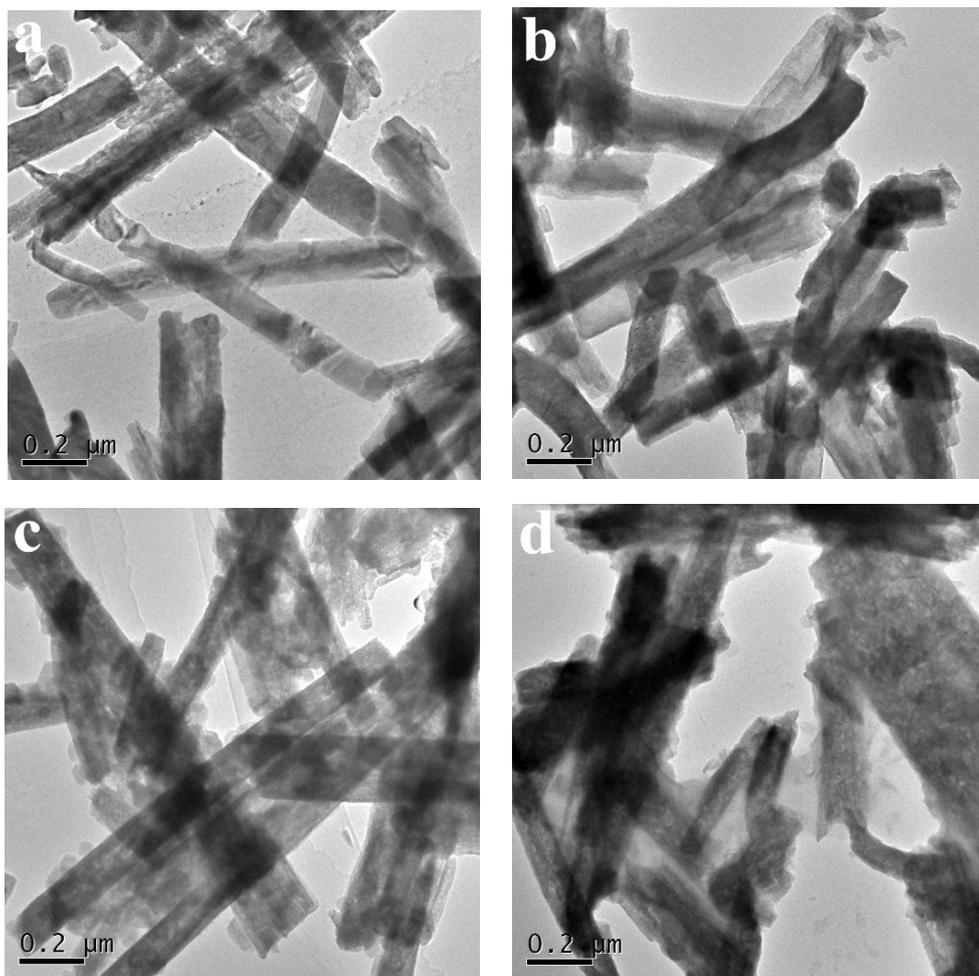


Figure S2. TEM images of: (a) CMS-2; (b) CMS-3; (c) CMS-4 and (d) CMS-5.

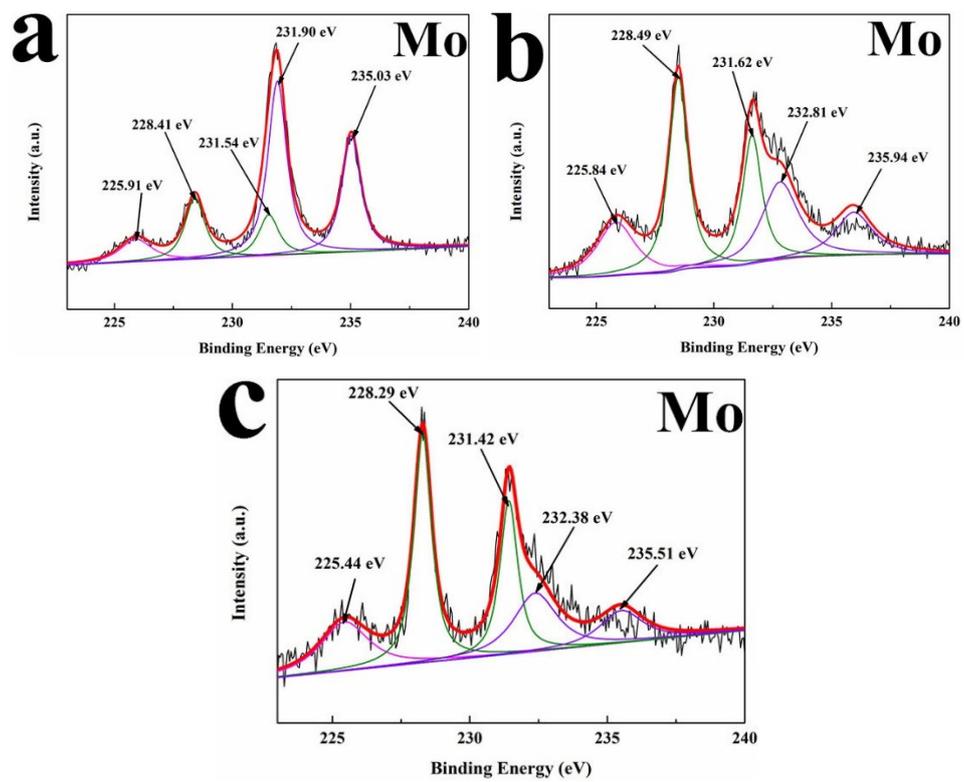


Figure S3. XPS high-resolution scans of Mo 3d of: (a) CMS-2; (b) CMS-4 and (c) CMS-5.

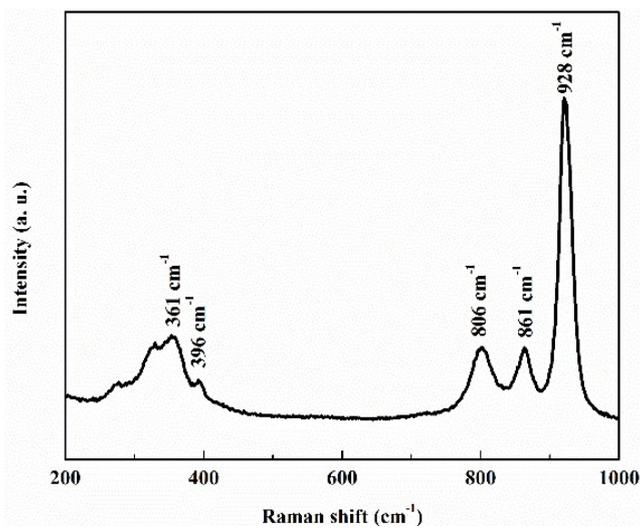


Figure S4. Raman spectrum for CMS-3.

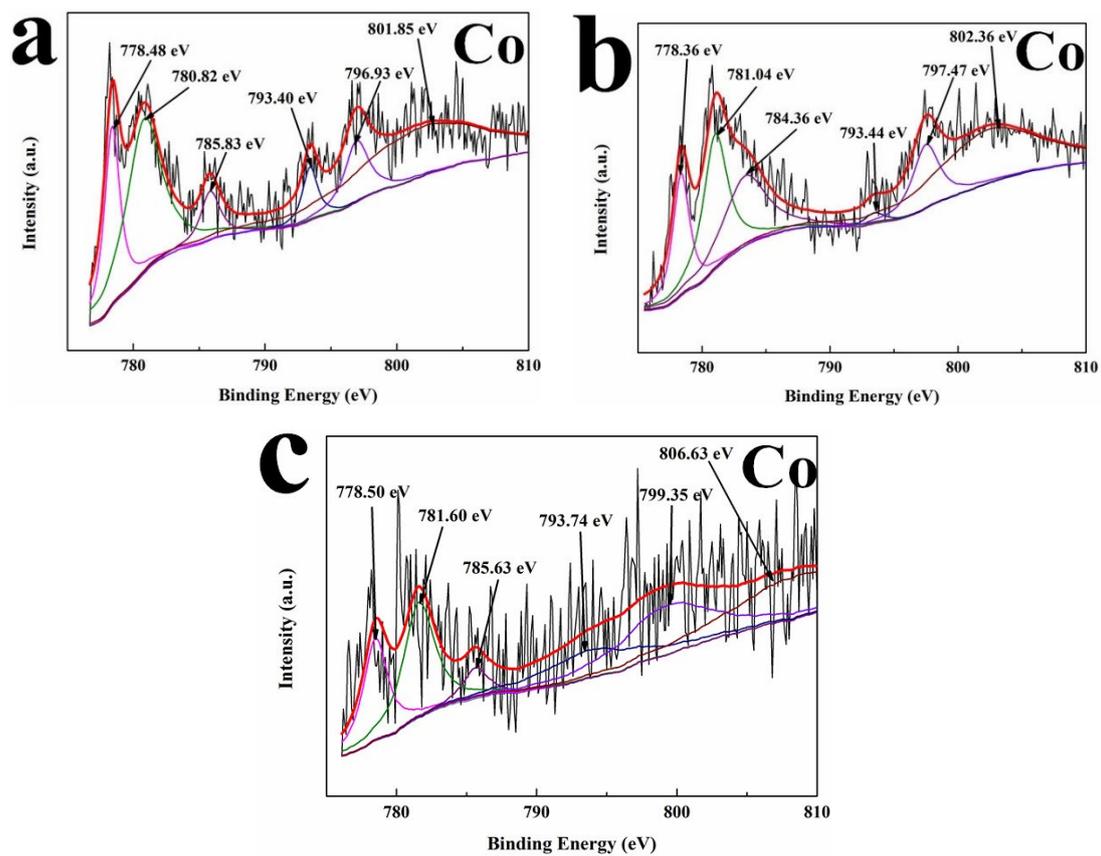


Figure S5. XPS high-resolution scans of Co 2p of: (a) CMS-2; (b) CMS-4 and (c)

CMS-5.

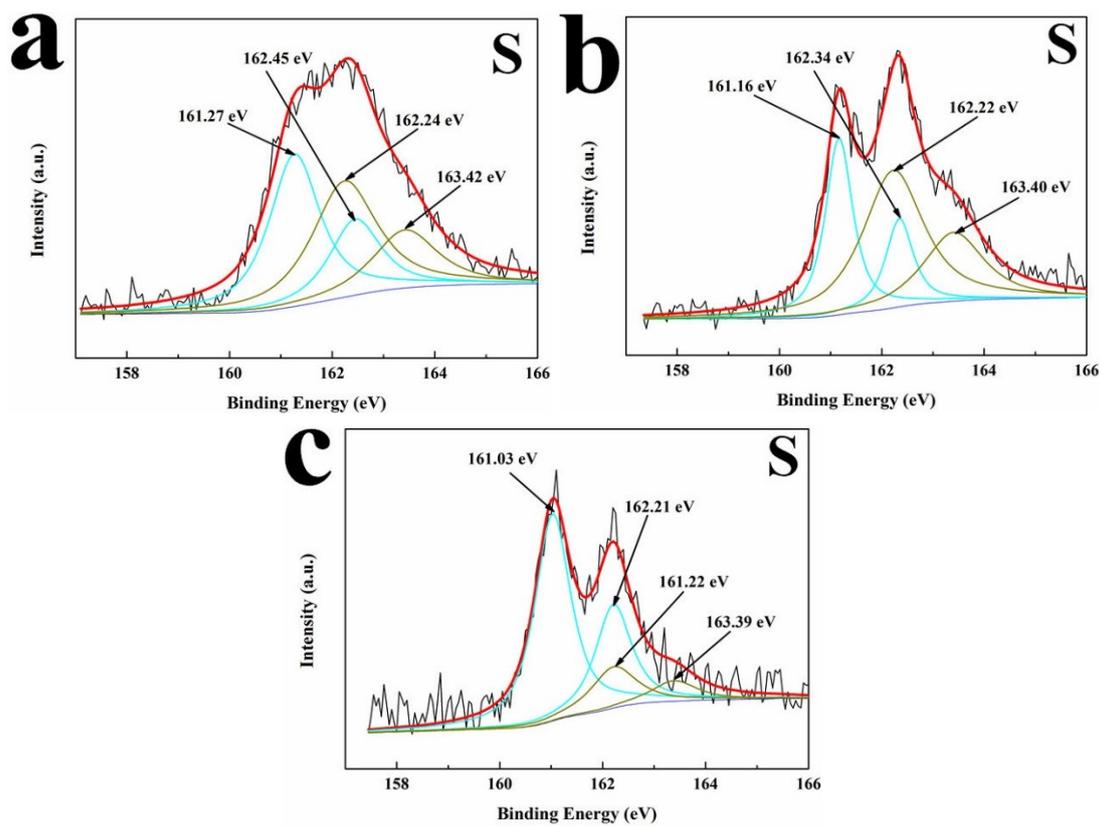


Figure S6. XPS high-resolution scans of S 2p of: (a) CMS-2; (b) CMS-4 and (c) CMS-5.

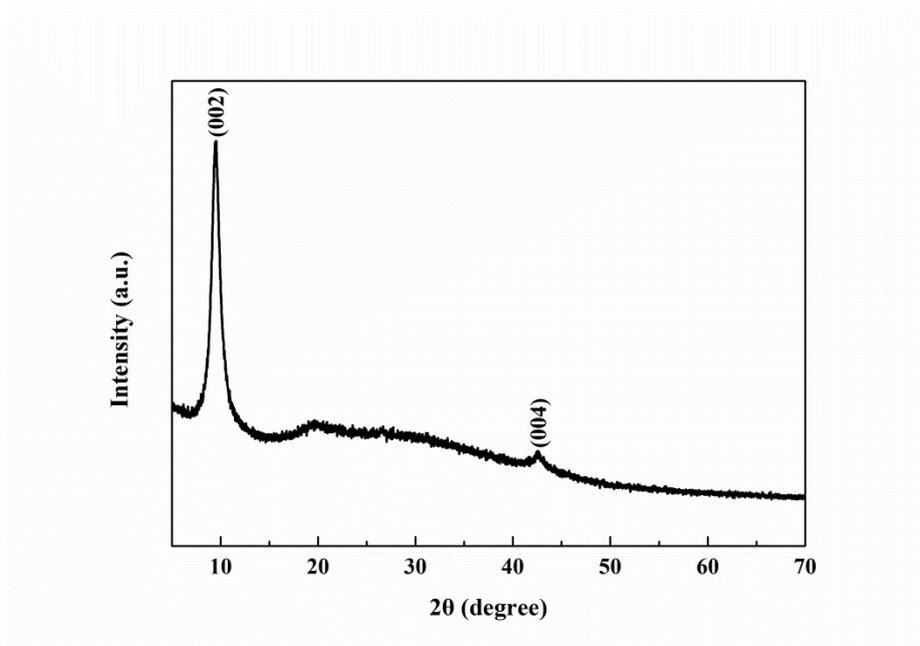


Figure S7. XRD patterns of GO.

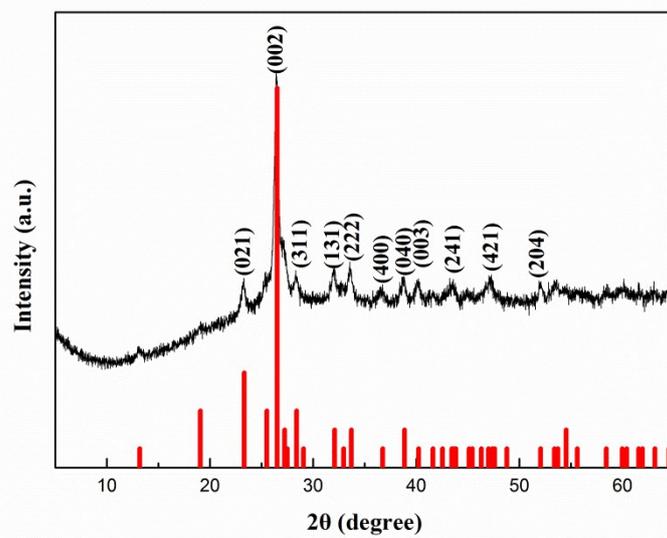


Figure S8. XRD patterns of CoMoO₄/NRGO.

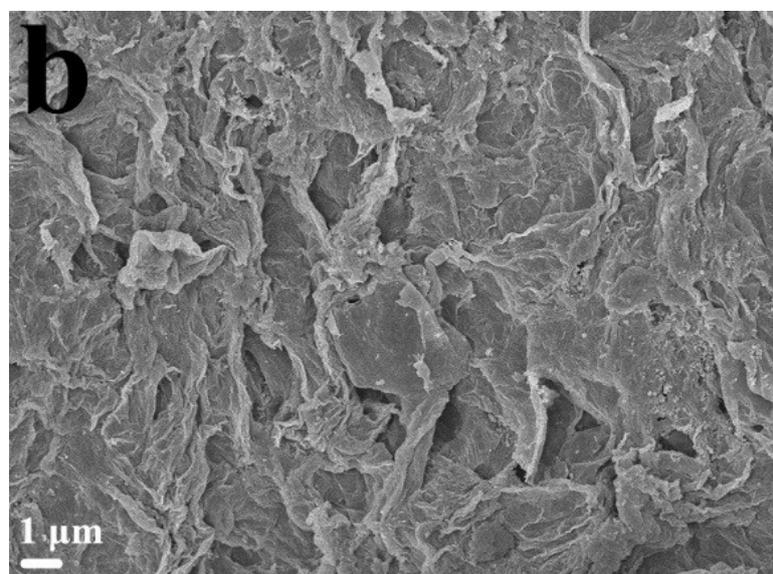
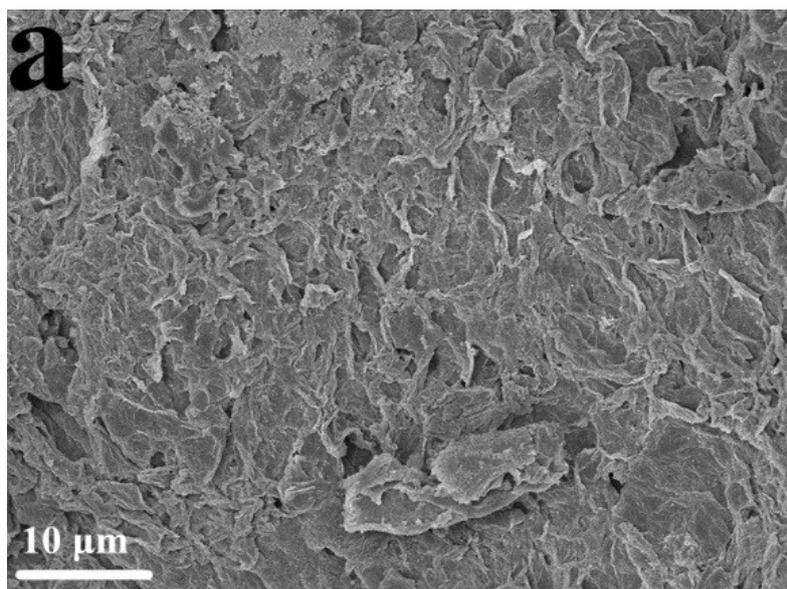


Figure S9. SEM images of GO.

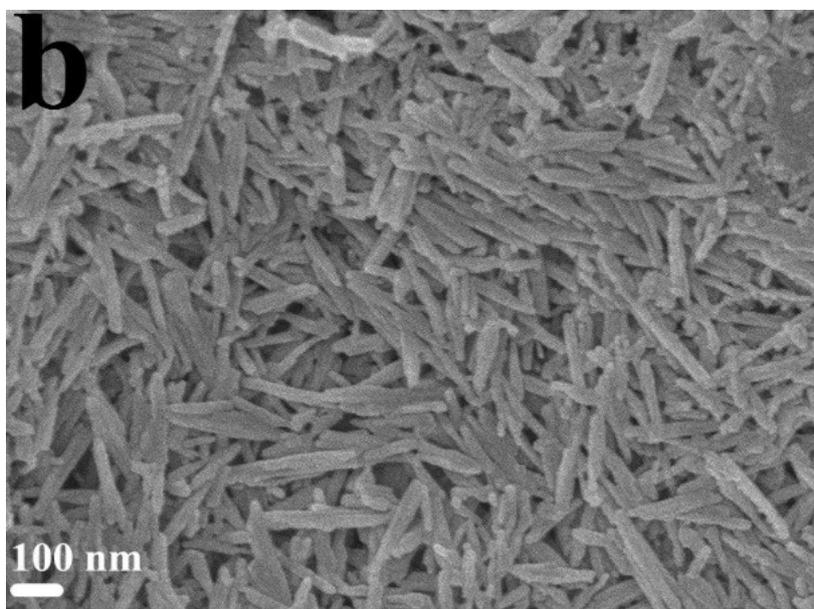
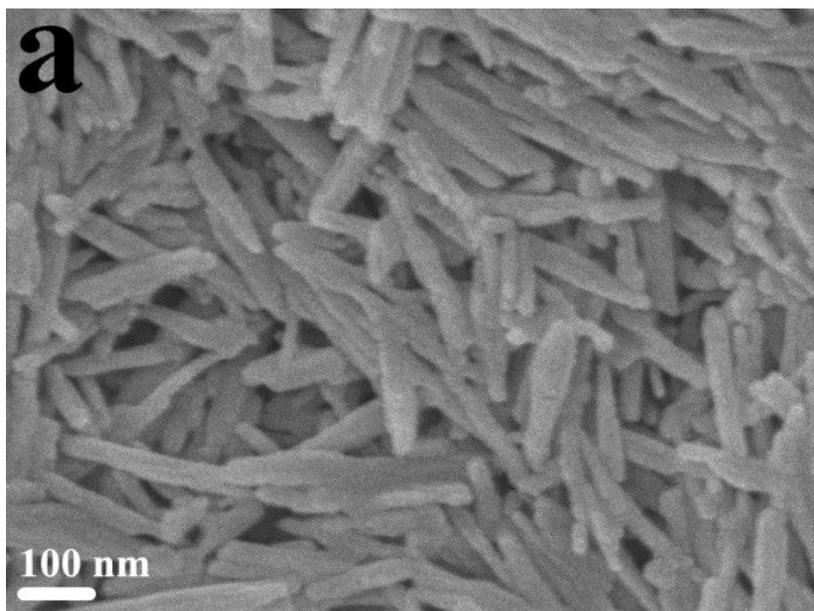


Figure S10. SEM images of CMO/NRGO.

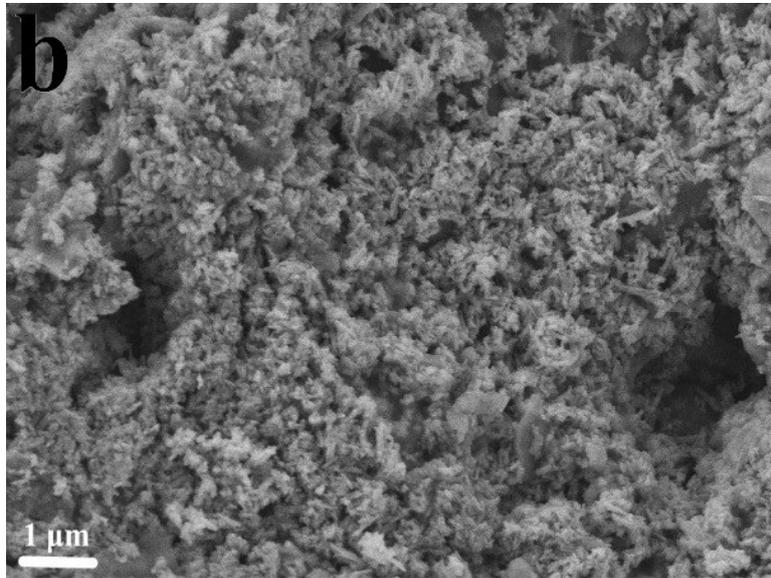
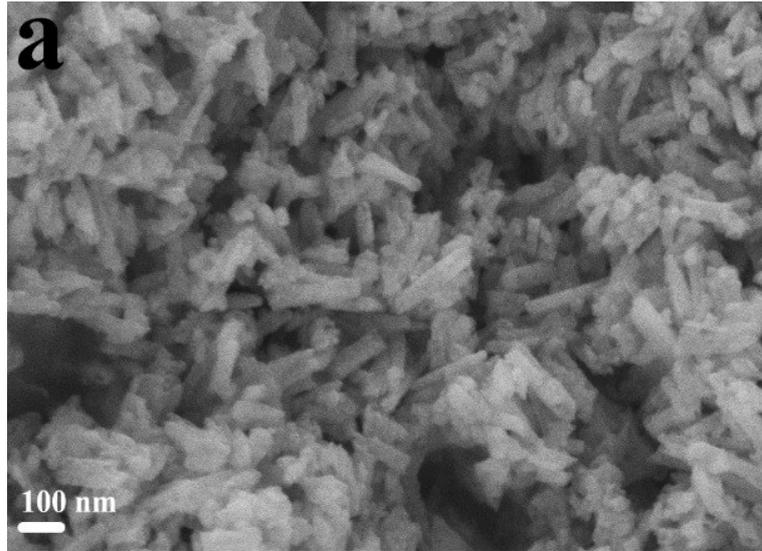


Figure S11. (a, b) SEM images of CMS-3/NRGO after long-term test.

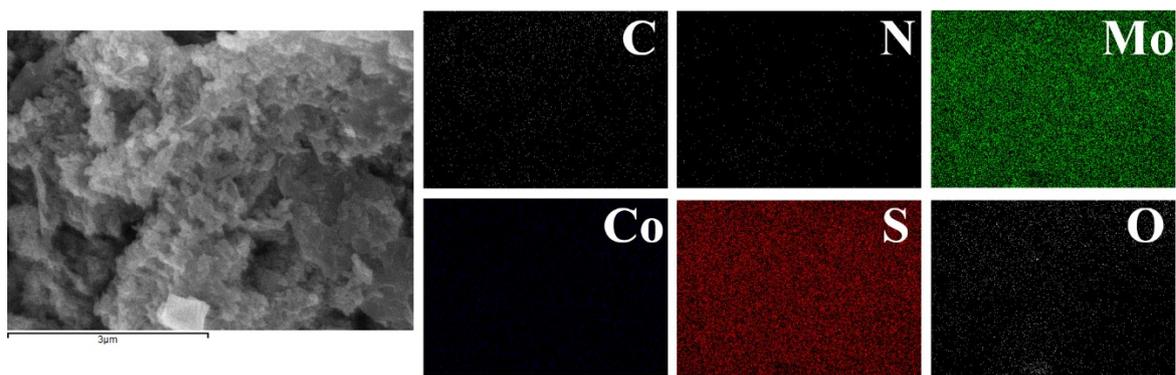


Figure S12. SEM mapping of CMS-3/NRGO after long-term test.

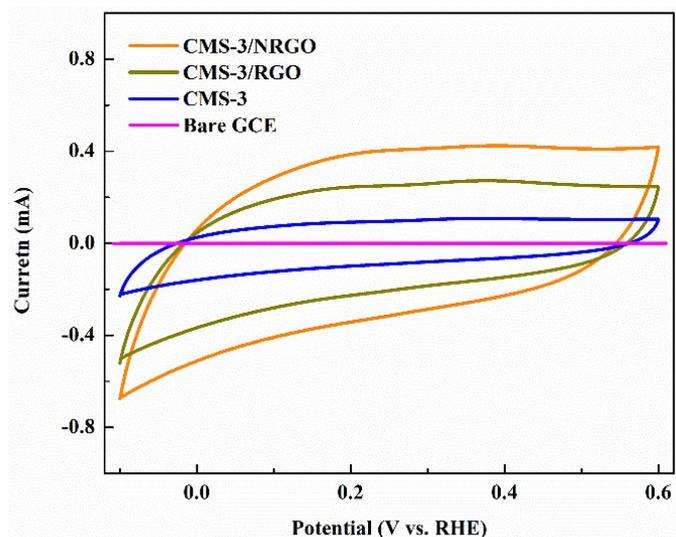


Figure S13. CVs of CMS-3/NRGO, CMS-3/RGO, CMS-3 and bare GCE at pH=7

with a scan rate of 50 mV s⁻¹.