Supporting Information

Mesoporous $CuCo_2O_4$ nanograss as multi-functional electrodes for supercapacitors and electro-catalysts

Jinbing Cheng[†a,b], Hailong Yan[†a,b], Yang Lu[†a,b,c], Kangwen Qiu[†a,b], Xiaoyi Hou[a,b], Jinyou Xu[a,b], Lei Han[a], Xianming Liu[d], Jang-Kyo Kim[e] and Yongsong Luo[*a,b]

[a]*School of Physics and Electronic Engineering, Xinyang Normal University, Xinyang 464000, P. R. China.*

[b]*Key Laboratory of Advanced Micro/Nano Functional Materials, Xinyang Normal University, Xinyang 464000, P. R. China.*

[c]*School of Material Science and Engineering, Hebei University of Technology, Tianjin 300130, P. R. China.*

[d]*College of Chemistry and Chemical Engineering, Luoyang Normal University, Luoyang 471022, P. R. China.*

[e]*Department of Mechanical and Aerospace Engineering, The Hong Kong University of Science and Technology, Clear Water Bay, Kowloon, Hong Kong, P. R. China.*

[*] To whom correspondence should be addressed：E-mail: ysluo@xynu.edu.cn

† These authors contribute equally to this work.

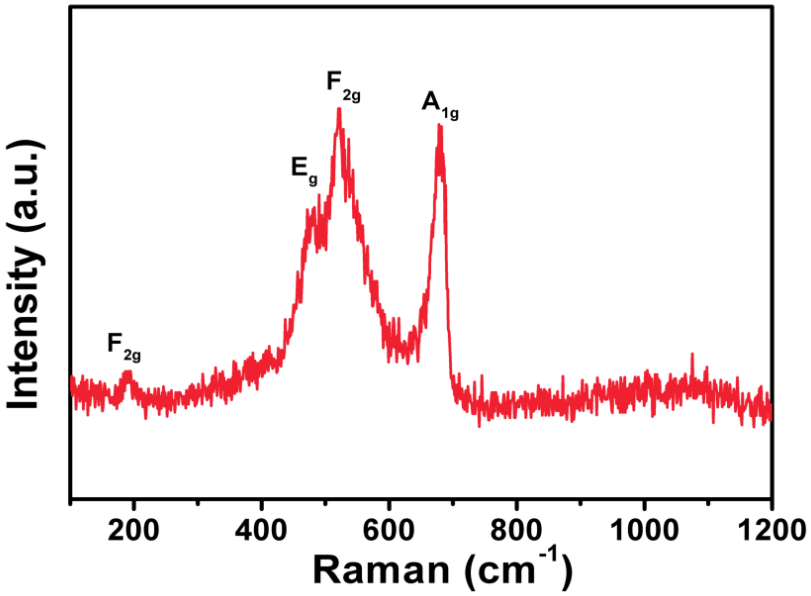

Fig. S1 Raman spectra of $CuCo_2O_4$ nanograss.

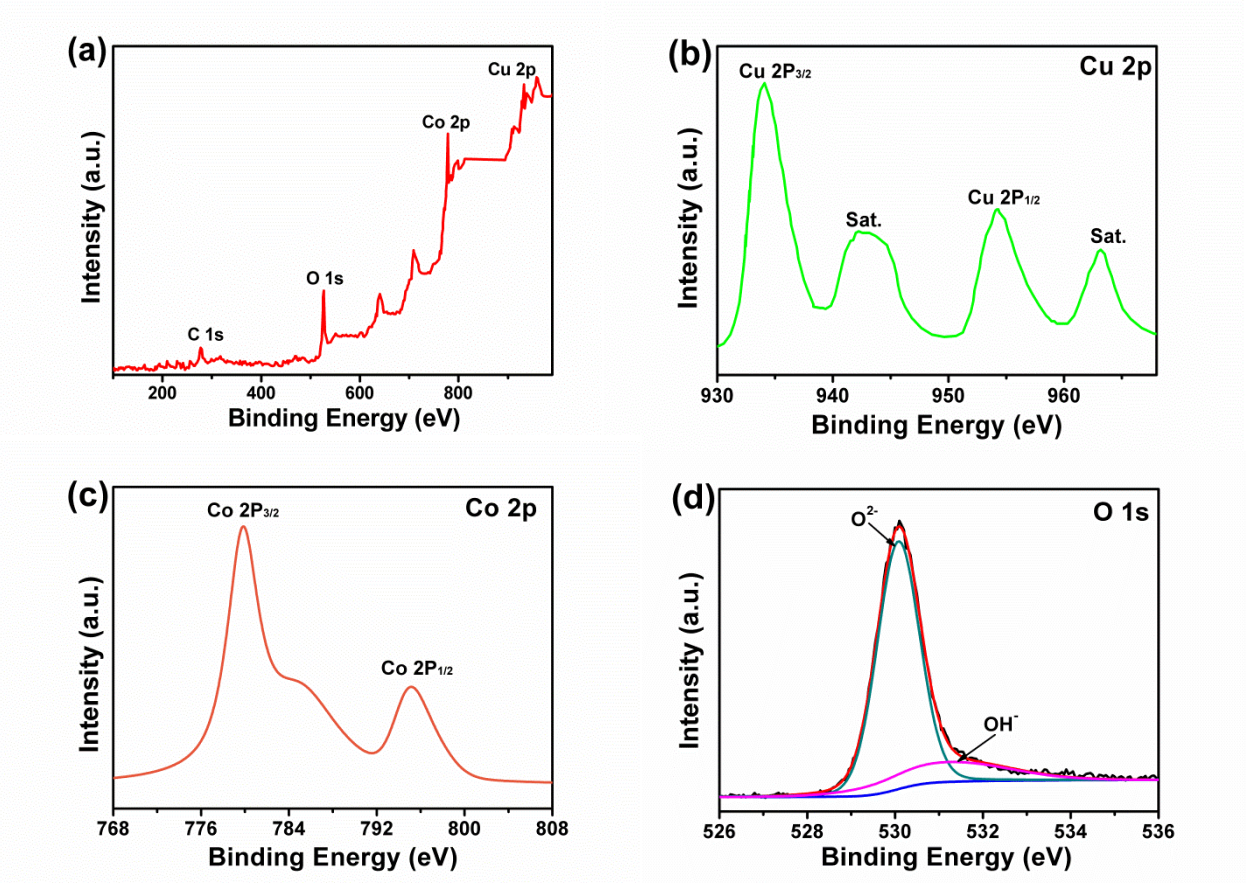

Fig. S2 (a) XPS spectra of $CuCo_2O_4$ nanograss; and (b-d) XPS deconvoluted scans of Cu 2p, Co 2p and O 1s, respectively.

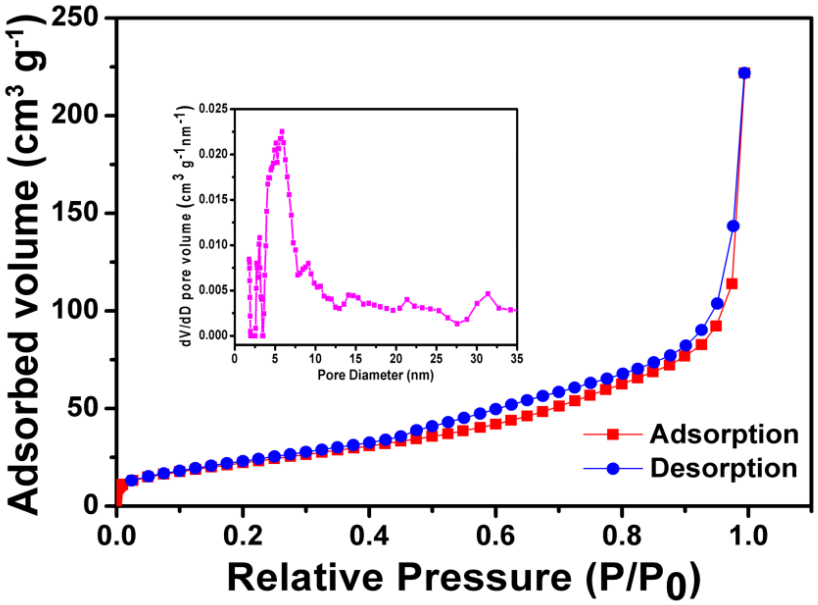

Fig. S3 Nitrogen adsorption/desorption isotherms measured at 77 K of $CuCo_2O_4$ nanograss, and the corresponding Barrett-Joyner-Halenda (BJH) poresize distribution curve (inset).

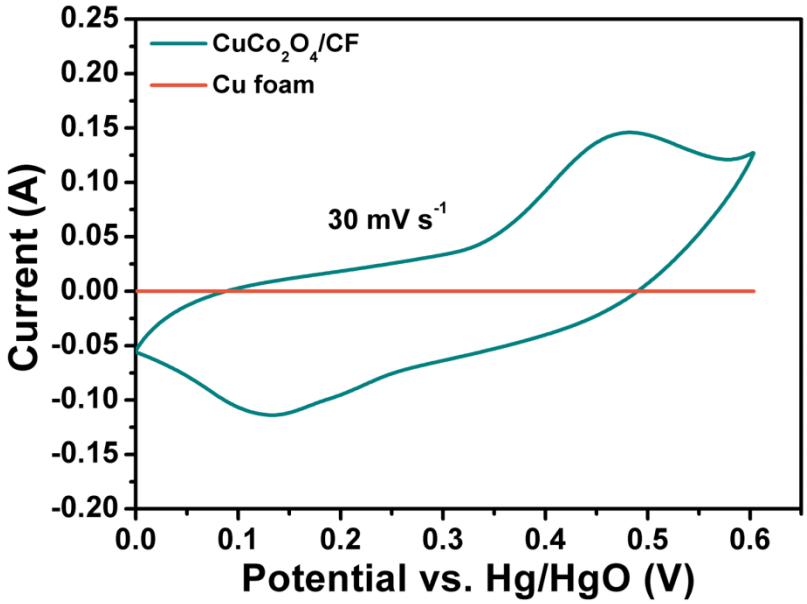

Fig. S4 CV curves for $CuCo_2O_4$ and neat Cu foam electrodes, recorded at a scan of 30 mV s^{-1}.

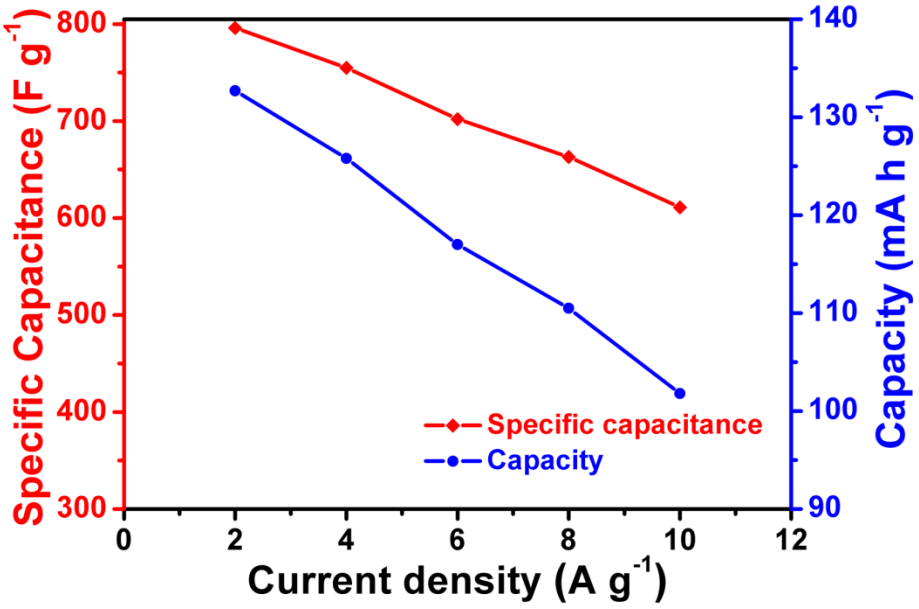

Fig. S5 Specific capacitances and capacities of the $CuCo_2O_4$ electrode at different current densities.

Table S1 Charge transfer resistance (R_{ct}) and internal resistance (R_s) of the $CuCo_2O_4$ nanograss electrode measured after 1st and 5000th cycles.

Cycles	R_{ct} (Ω)	R_s (Ω)
1st	3.34	1.86
5000th	3.85	1.95