Supplementary information

Construction of light-sensitive Cu_2O/Fe_2O_3 heterostructures to promote photocatalytic CO_2 reduction and photo-assisted charge storage

Xiankui Lv, [a] Hongran Yang, [a] Weiting Meng, [a] Muhammad Arif, [a]
Xiaobo Feng, [ab] Weibin Zhang,*[ab] and Ting Zhu* [ab]

[a] School of Physics and Electronic Information, Yunnan Normal University, 768 Juxian Street, Kunming 650500, China.
[b] Yunnan Key Laboratory of Optoelectronic Information Technology, School of Physics and Electronic Information, Yunnan Normal University, Kunming 650500, China.

*Emails: 220001@ynnu.edu.cn (W. B. Zhang); zhut0002@ynnu.edu.cn (T. Zhu)

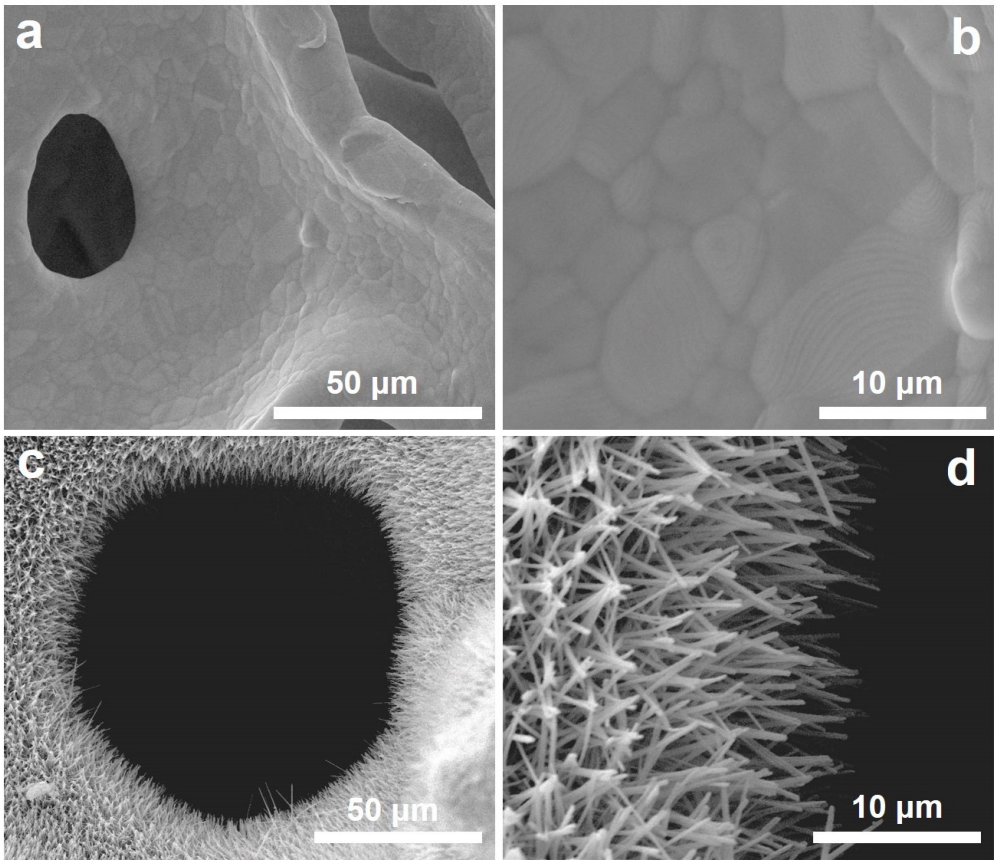

Fig. S1. SEM images of the bare Cu foam (CF, a and b), and CF supported $Cu(OH)_2$ NAs (c and d).

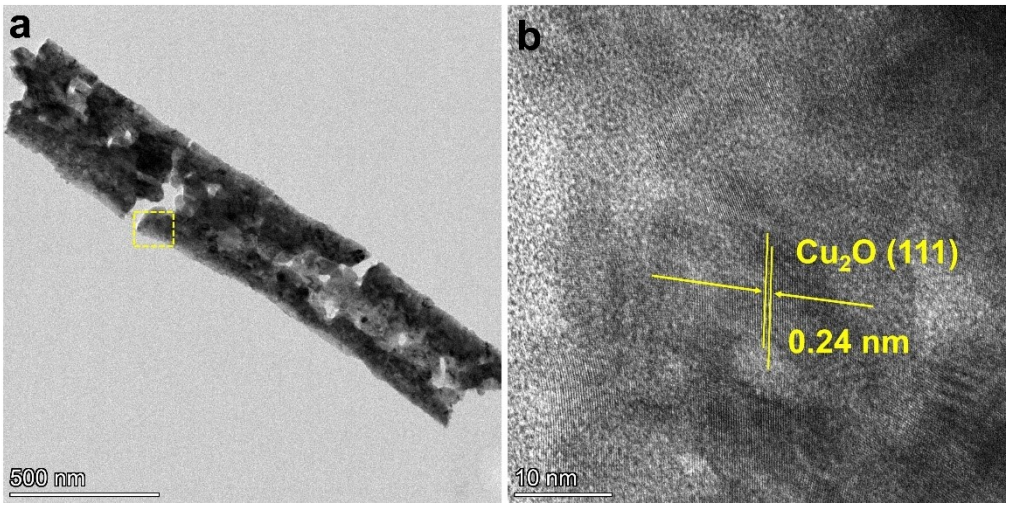

Fig. S2. TEM (a) and HR-TEM (b) images of the Cu_2O/Fe_2O_3-15 sample.

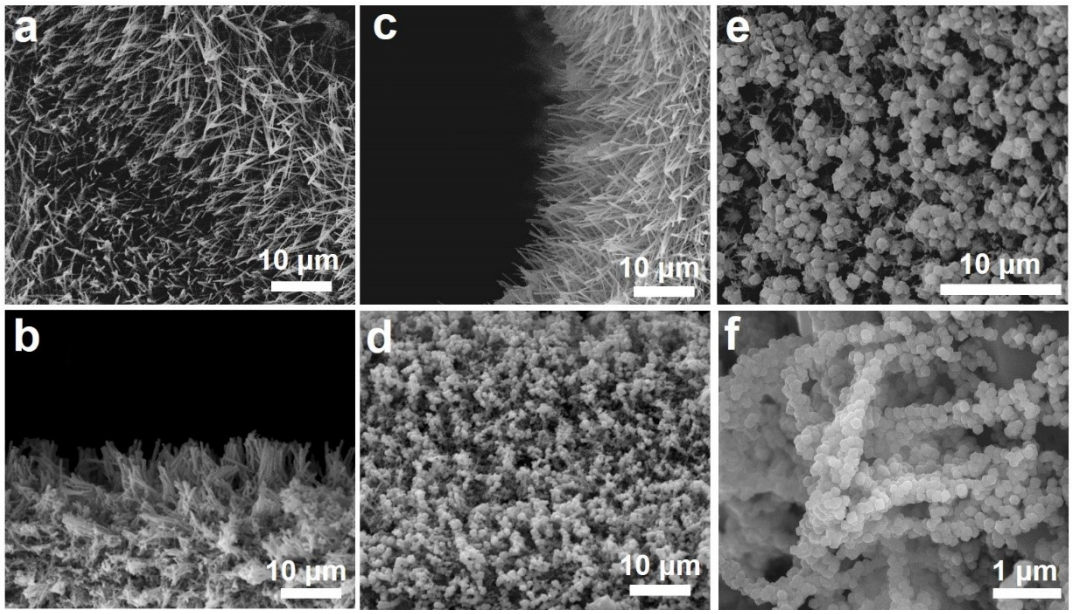

Fig. S3. SEM images of the Cu_2O/Fe_2O_3-1 (a and b), Cu_2O/Fe_2O_3-5 (c and d), and Cu_2O/Fe_2O_3-30 (e and f) samples.

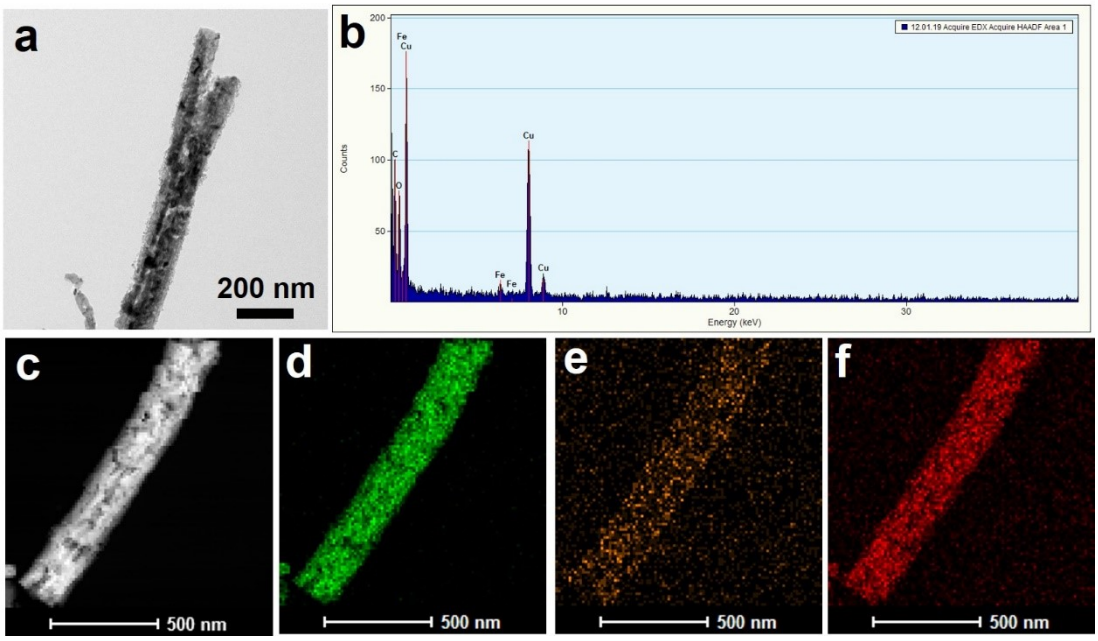

Fig. S4. TEM (a), EDX (b), HAADF (c), and elemental mappings (d-f: Cu, Fe, and O) of the Cu_2O/Fe_2O_3-1 sample.

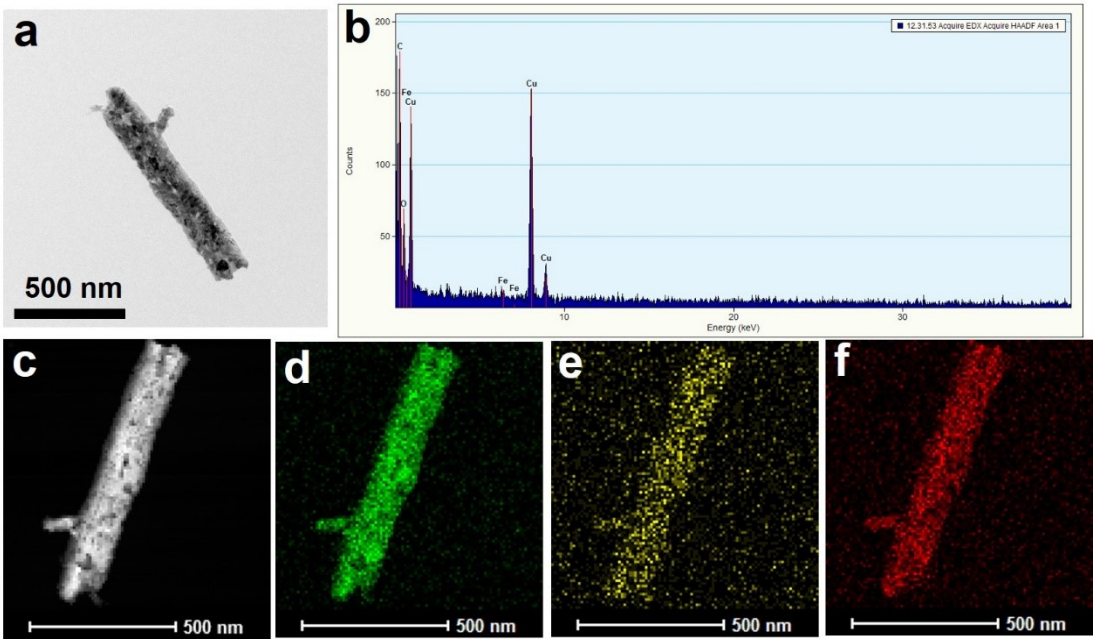

Fig. S5. TEM (a), EDX (b), HAADF (c), and elemental mappings (d-f: Cu, Fe, and O) of the Cu_2O/Fe_2O_3-5 sample.

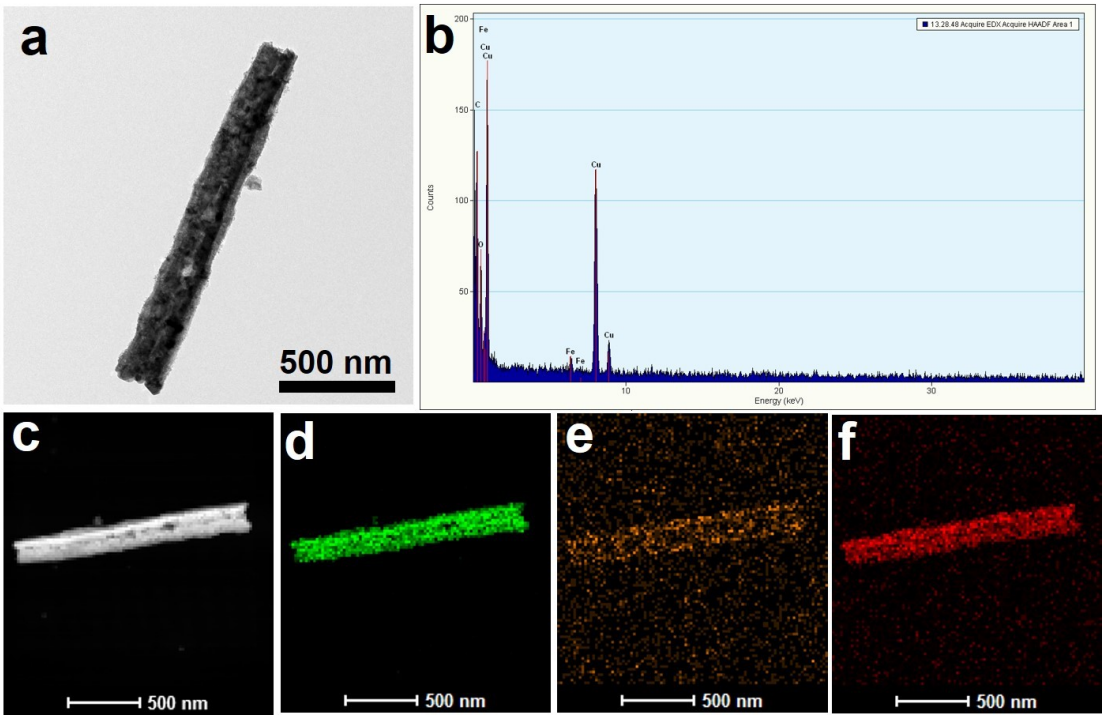

Fig. S6. TEM (a), EDX (b), HAADF (c), and elemental mappings (d-f: Cu, Fe, and O) of the Cu_2O/Fe_2O_3-30 sample.

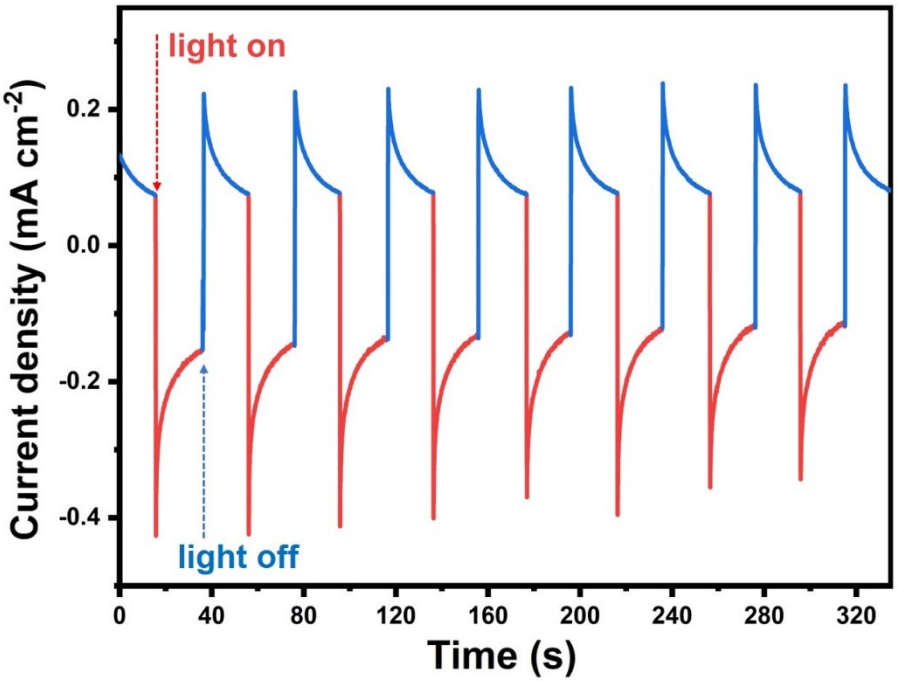

Fig. S7. Photocurrent response of the typical Cu_2O/Fe_2O_3-15 sample recorded at a bias of 0.1 V.

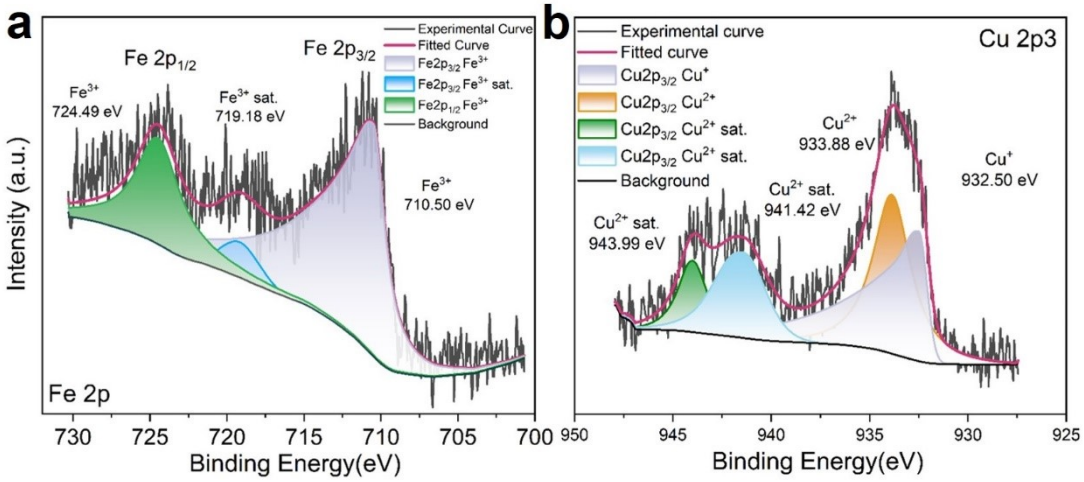

Fig. S8. XPS spectra of Fe 2p (a) and Cu 2p (b) of the typical Cu_2O/Fe_2O_3-15 sample.

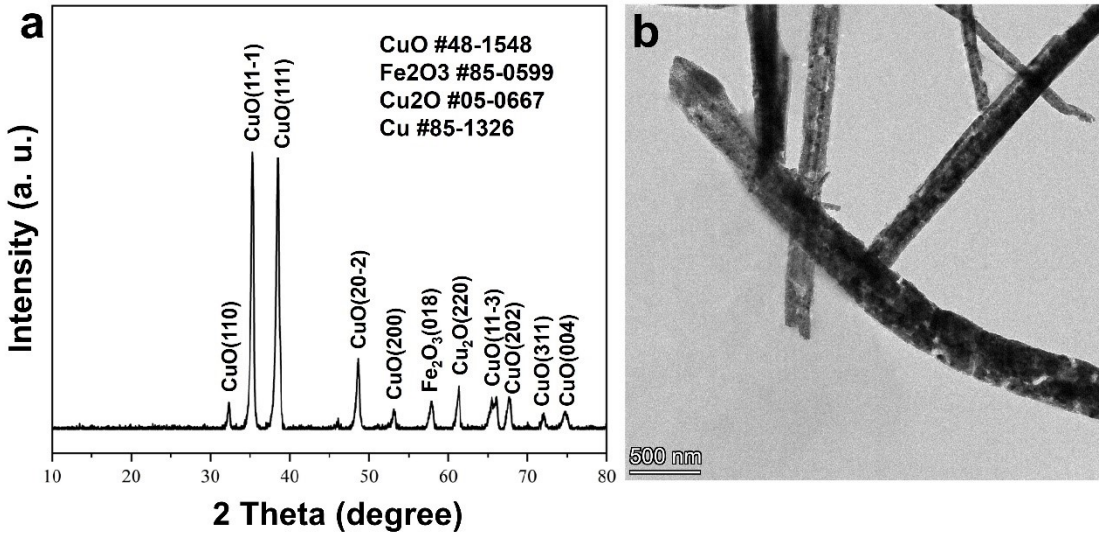

Fig. S9. XRD (a) and TEM (b) results of the Cu_2O/Fe_2O_3-15 sample after photocatalytic tests for 10 times.

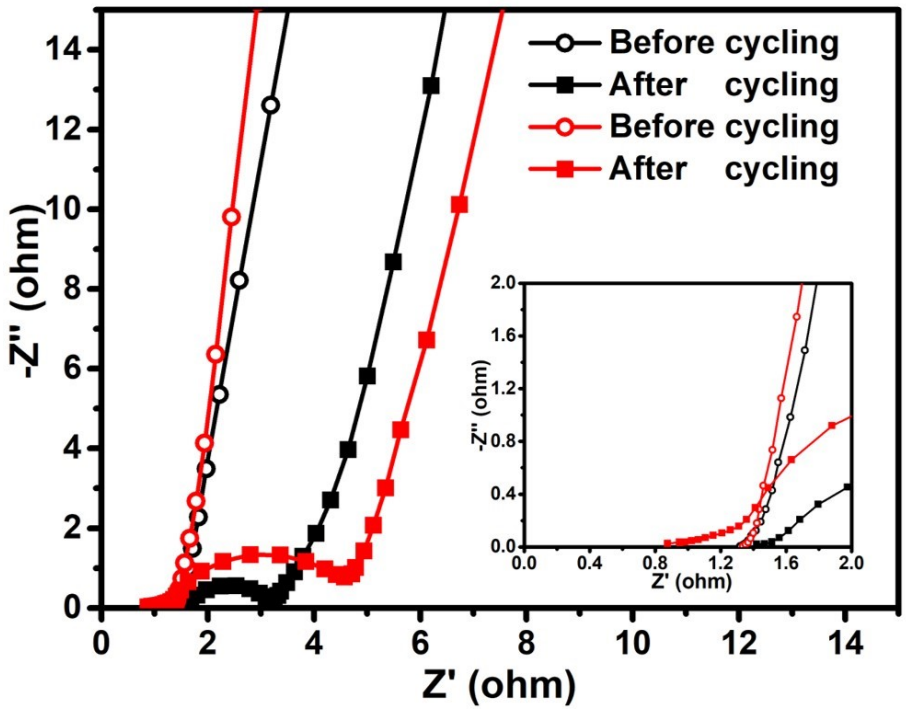

Fig. S10. EIS spectra of the typical Cu_2O/Fe_2O_3-15 sample obtained before and after cycling performances with (red curves) or without (black curves) light irradiation for supercapacitors.

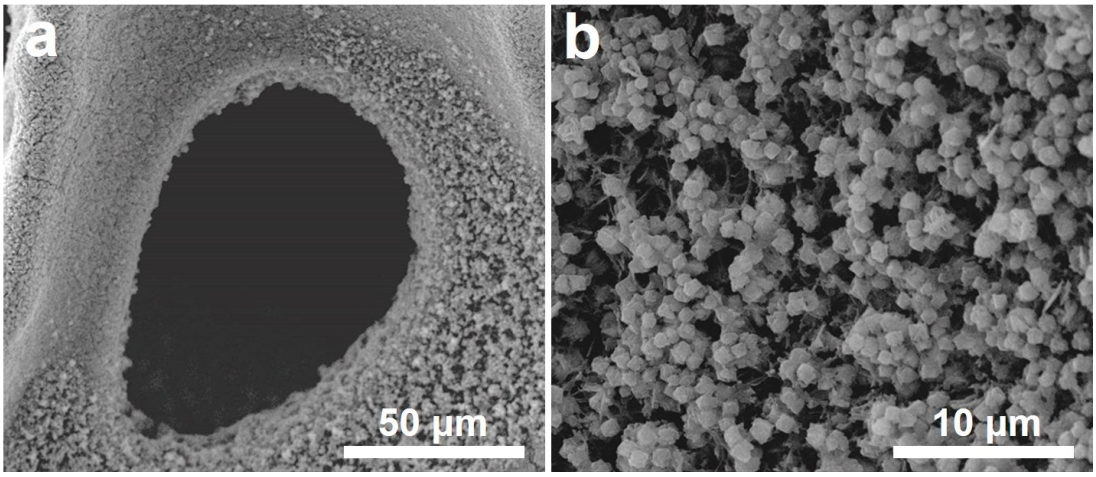

Fig. S11. SEM images of the Cu_2O/Fe_2O_3-15 sample after cycling tests for supercapacitors.