

## Electronic Supplemental Information

### Morphology control of Cu and Cu<sub>2</sub>O through electrodeposition on conducting polymer electrodes

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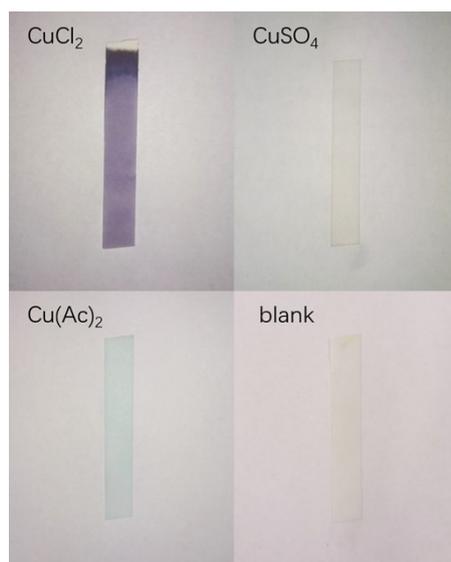
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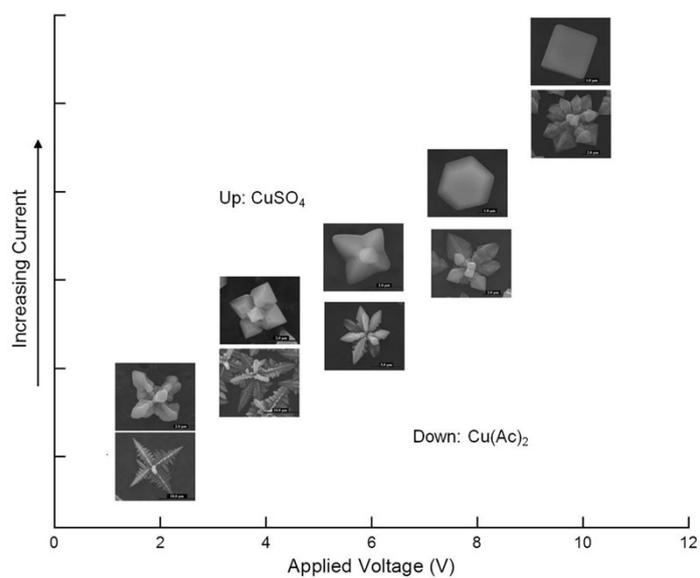
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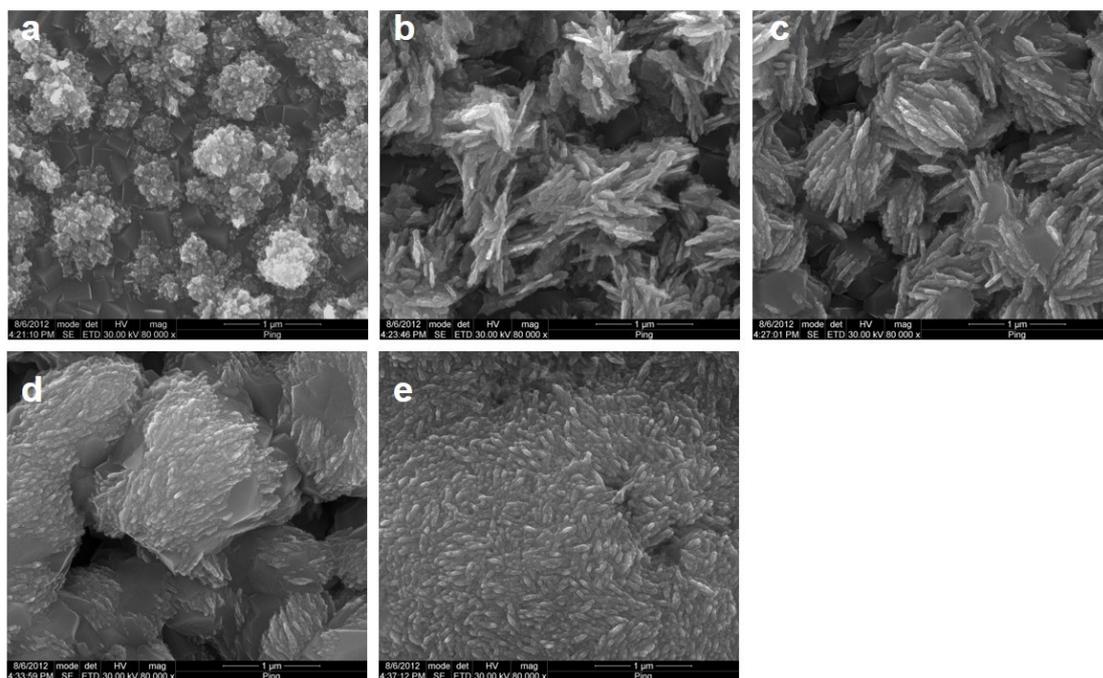
### Additional Figures



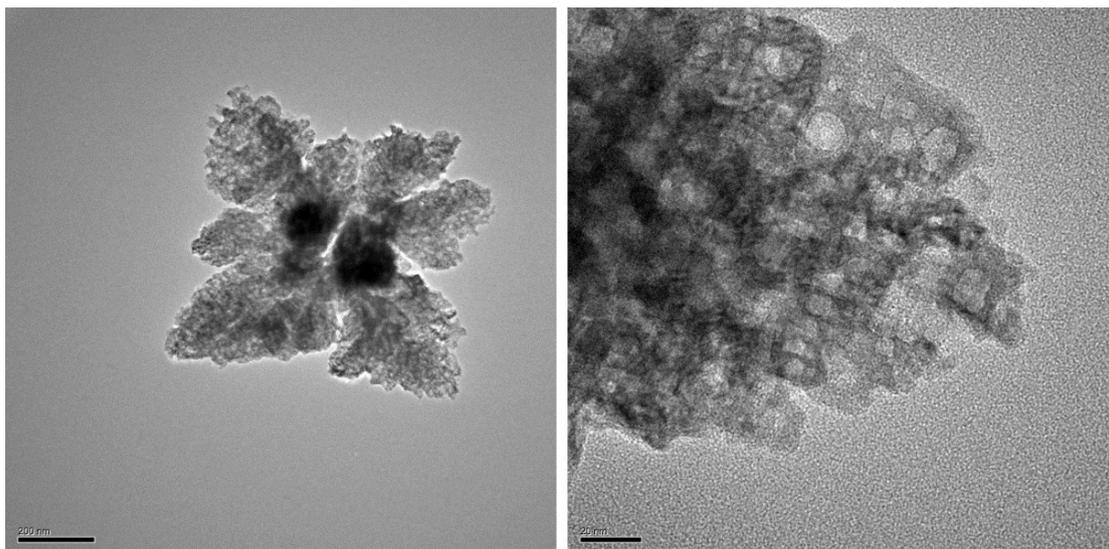
**Fig. S1** The color of the potassium iodide-starch test paper immersed in the used electrolyte after 20 minutes.



**Fig. S2** SEM images of Cu and Cu<sub>2</sub>O particles electrochemically deposited on PANI surfaces under various applied electric fields (2, 4, 6, 8, and 10 V). Cu and Cu<sub>2</sub>O particles are prepared by using copper sulfate and copper acetate as copper precursor, respectively.



**Fig. S3** SEM images of Cu<sub>2</sub>O particles electrochemically deposited on ITO surfaces from Cu(Ac)<sub>2</sub> concentration (a) 5 mM, (b) 10 mM, (c) 20 mM, (d) 50 mM, and (e) 100 mM. Applied voltage: 2 V, electrodeposition time: 10 min.



**Fig. S4** TEM images of Cu<sub>2</sub>O particles deposited on PANI surface from 50 mM Cu(Ac)<sub>2</sub> at a reaction time of 2 s. Applied voltage: 6 V.