

Supporting information

Yolk-shell structured MnO_2 microspheres with oxygen vacancies for high-performance supercapacitors

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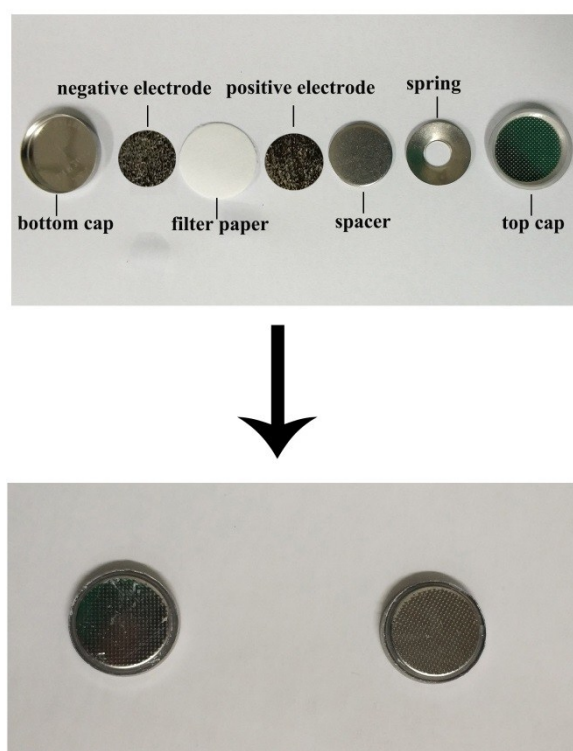


Figure S1. Schematic illustration of the fabrication process of $ov\text{-MnO}_2@MnO_2//AC$ ASC device.

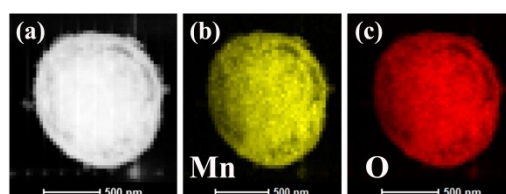


Figure S2. Elemental mapping images of Mn and O for $ov\text{-MnO}_2@MnO_2$.

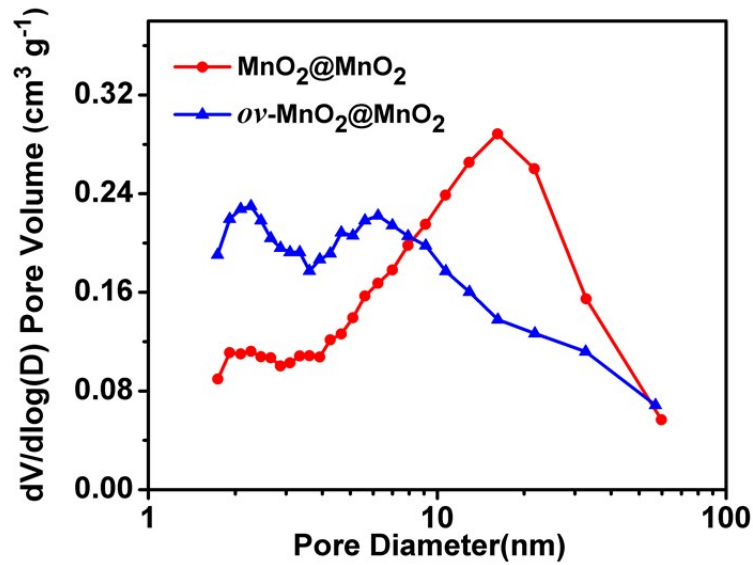


Figure S3. The pore size distribution of $\text{MnO}_2@\text{MnO}_2$ and $oV\text{-MnO}_2@\text{MnO}_2$.

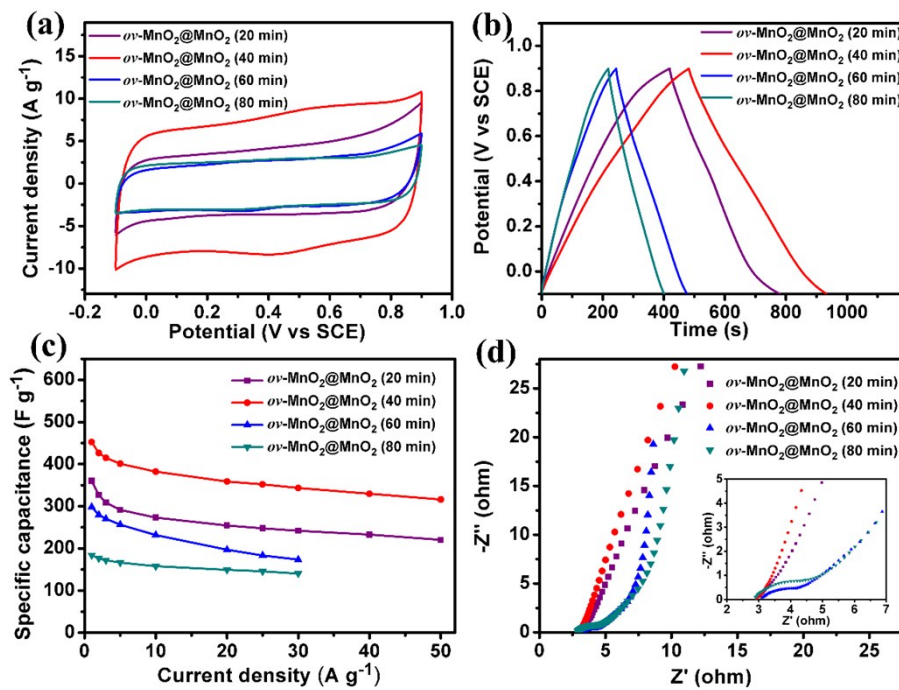


Figure S4. (a) Cyclic voltammetry recorded at a scan rate of 20 mV s^{-1} , (b) galvanostatic charge/discharge curves recorded at a current density of 1 A g^{-1} , (c) specific capacitance measured under different current densities and (d) EIS Nyquist plots at open circuit potential of as-prepared $oV\text{-MnO}_2@\text{MnO}_2$ at different heat treatment time.

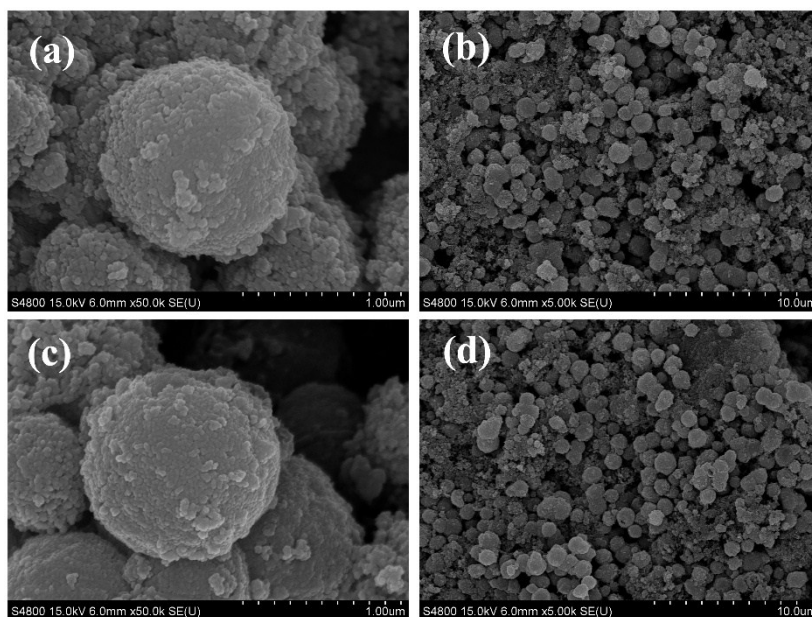


Figure S5. SEM images of the yolk-shell $ov\text{-MnO}_2@MnO_2$ electrode before and after repeated galvanostatic charge/discharge cycles: (a) the yolk-shell $ov\text{-MnO}_2@MnO_2$ electrode before charging-discharging; (b) the yolk-shell $ov\text{-MnO}_2@MnO_2$ electrode after 10000 cycles.

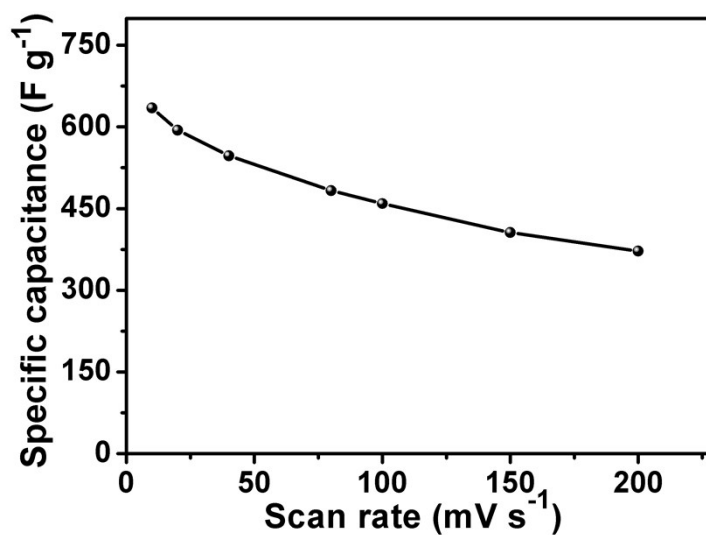


Figure S6. Calculated specific capacitances of the $ov\text{-MnO}_2@MnO_2$ at different scan rates.

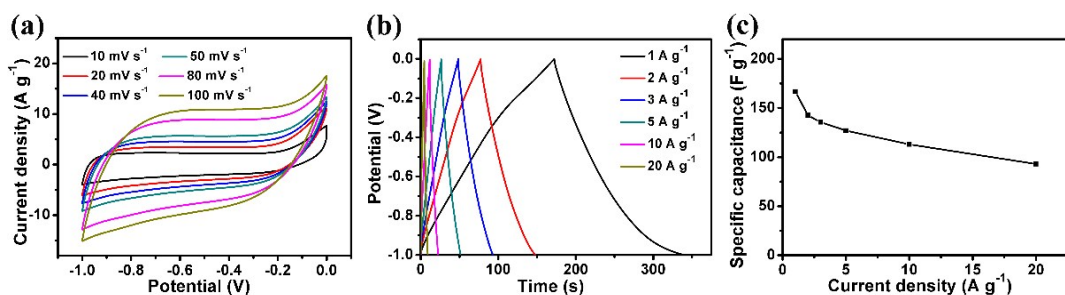


Figure S7. (a) CV curves at different scan rate, (b) GCD curves at different current densities and (c) Specific capacitance measured under different current densities of the AC electrode.

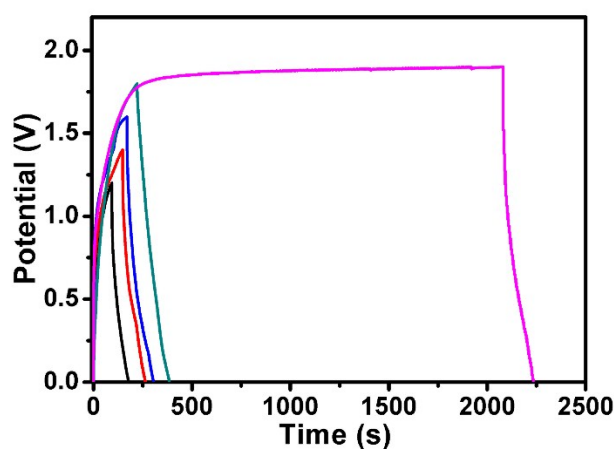


Figure S8. GCD curves at different potential windows of the *ov*-MnO₂@MnO₂//AC ASC.

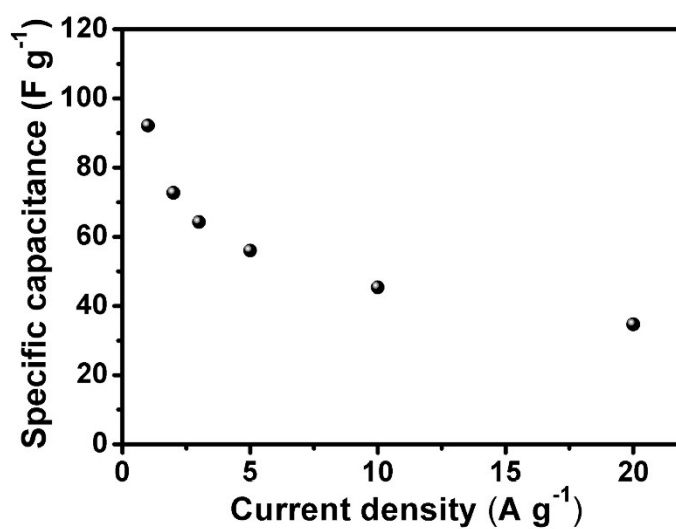


Figure S9. Specific capacitance measured under different current densities of the *ov*-MnO₂@MnO₂ microspheres//AC ASC.

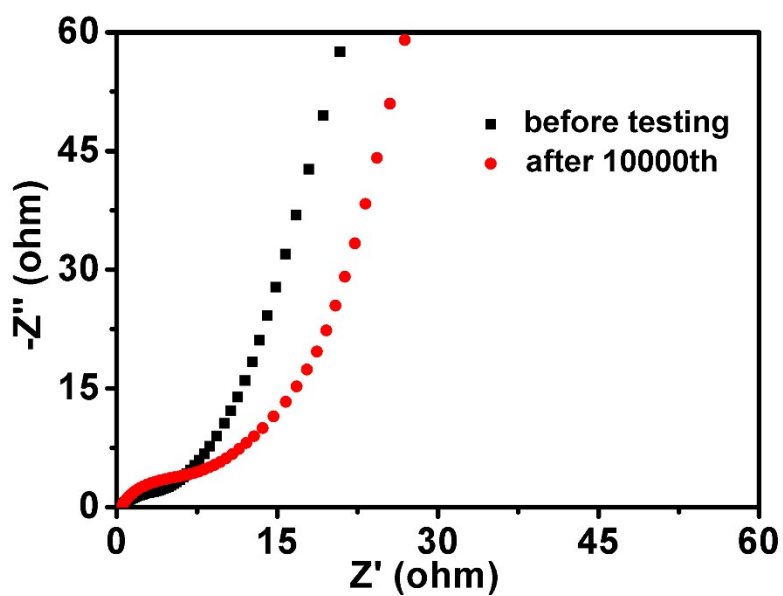


Figure S10. EIS Nyquist plots of the ASC device at open circuit potential before and after cycling test.

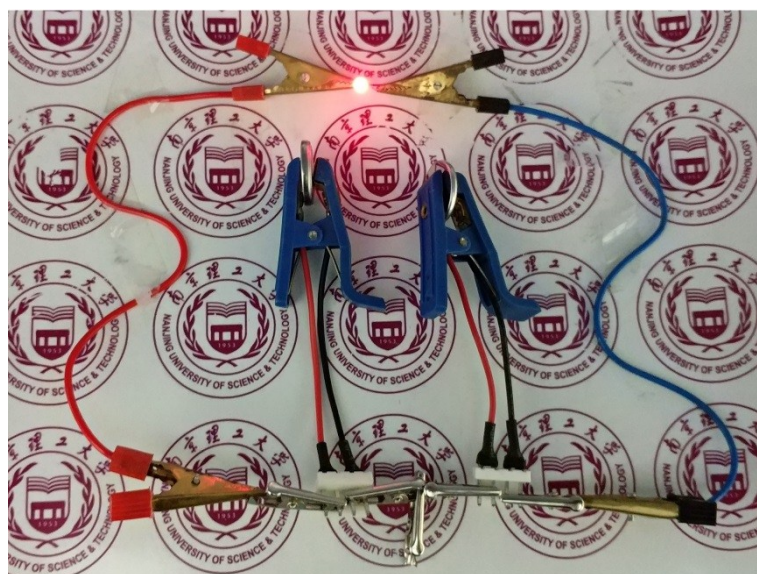


Figure S11. Optical image of the lightened LED lights.