

Supporting Information

Controlled synthesis of hierarchical porous carbons with different morphologies and their application for Potassium and Lithium ion batteries

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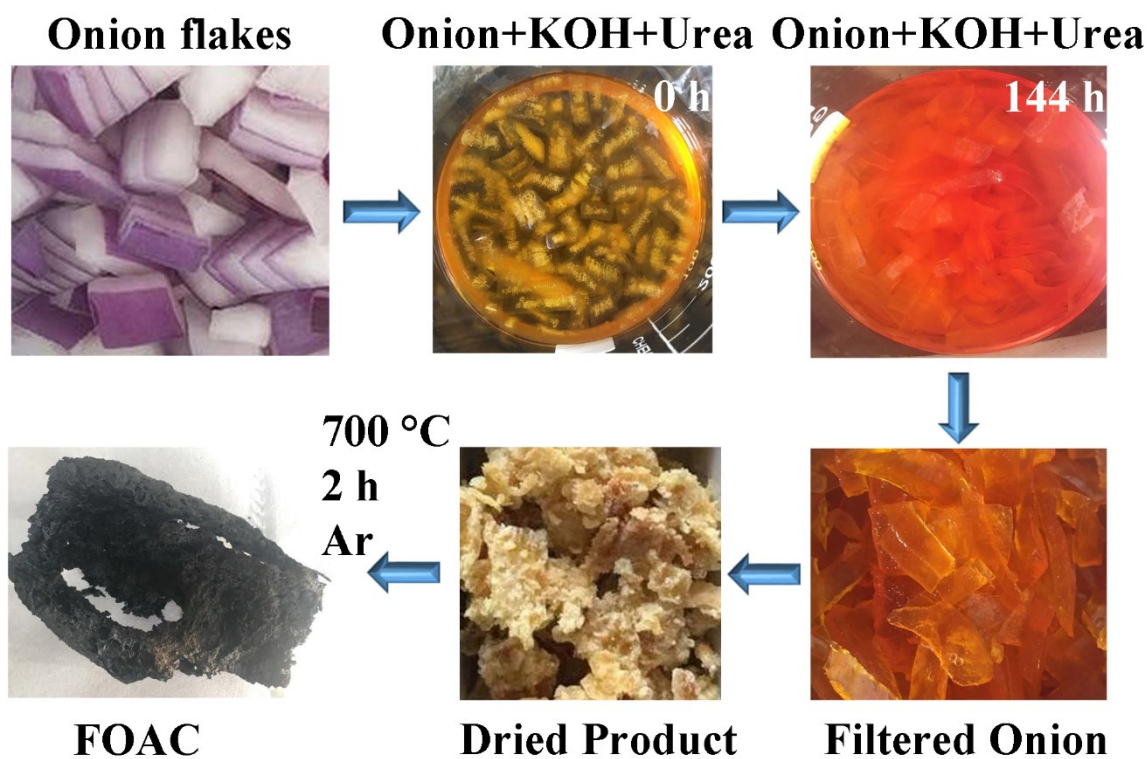


Figure S1 Processing of onion flakes to synthesize FOACs.

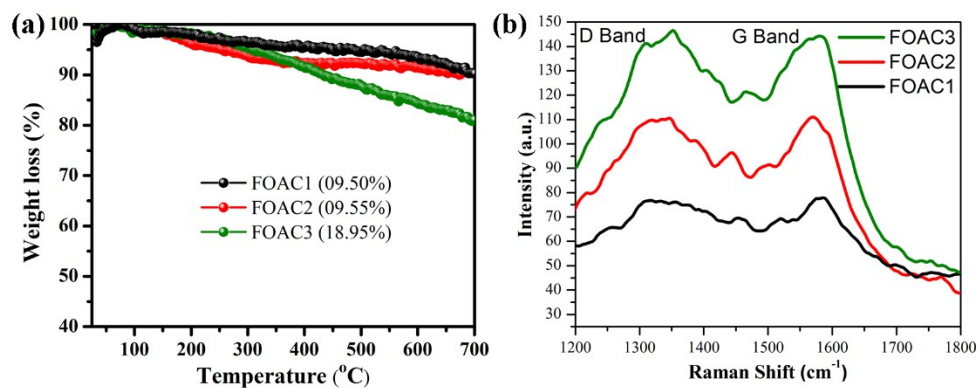


Figure S2 Thermogravimetric analysis (a) and Raman spectroscopy (b) of FOACs.

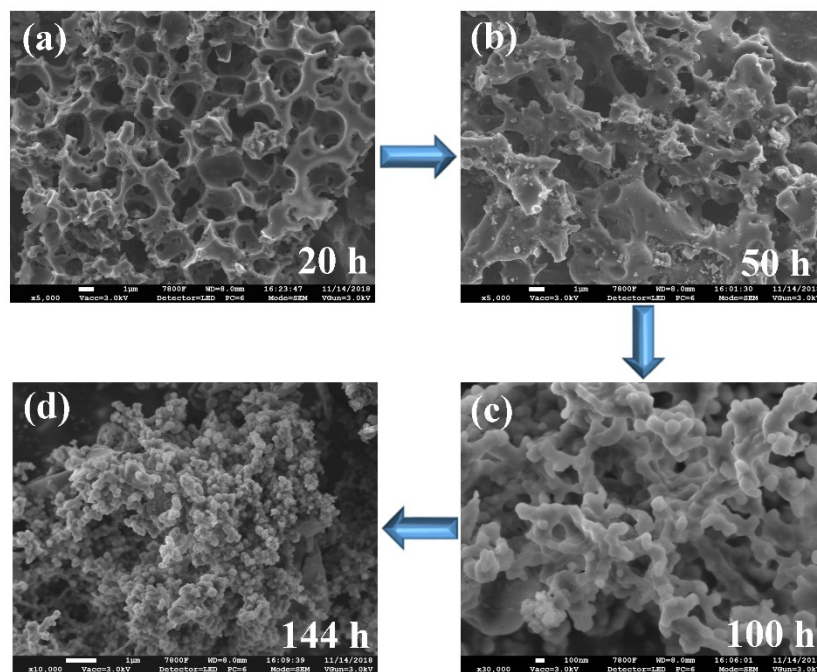


Figure S3 FESEM images of FOACs with different KOH soaking times (20, 50, 100, and 144 h).

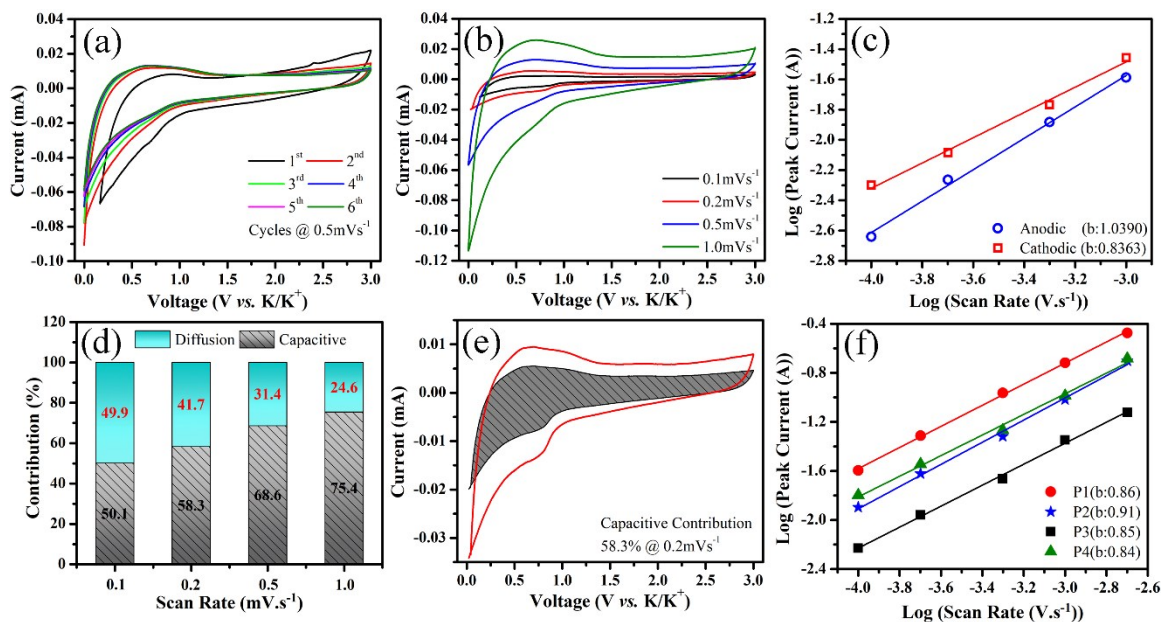


Figure S4 (a) CV spectrums (1st–6th) of FOAC3 electrode at scan rate of 0.5 mVs⁻¹ with the potential window from 0.0 V to 3.0 V, (b) CV spectrums measured at different scan rates (0.1-1.0 mVs⁻¹), (c) Linear relation of peak currents and scan rates of FOAC3 electrode, (d) contribution ratio of diffusion and capacitive-controlled capacity at different scan rates, and (e) capacitive contribution to total current at 0.2 mVs⁻¹ of PIBs; and (f) Linear relation of peak currents and scan rates of FOAC3 electrode of LIBs.

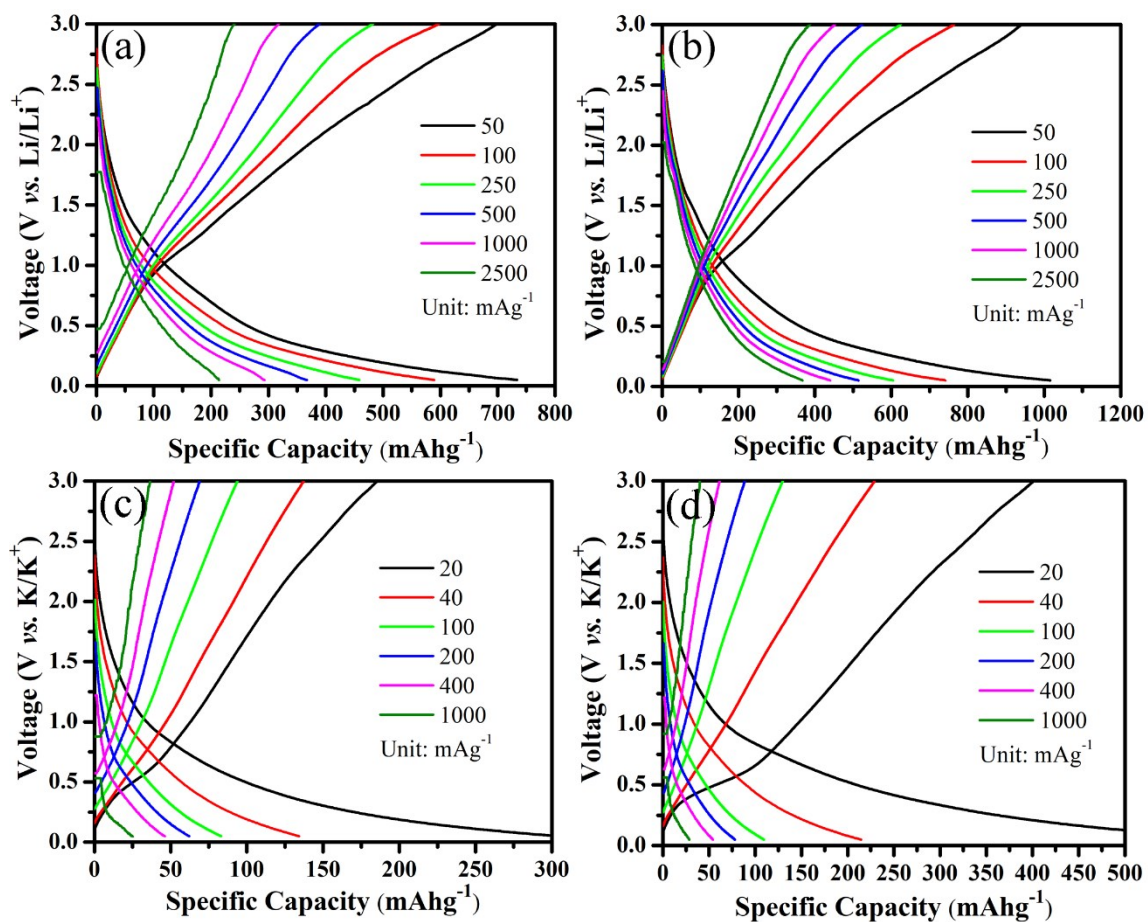


Figure S5 Charge-discharge voltage profiles of FOAC1 (a) and FOAC2 (b) electrode at different current densities against Li/Li⁺; Charge-discharge voltage profiles of FOAC3 electrodes in DEC/EC (c) and PC/EC (d) solvents at different current densities against K/K⁺.

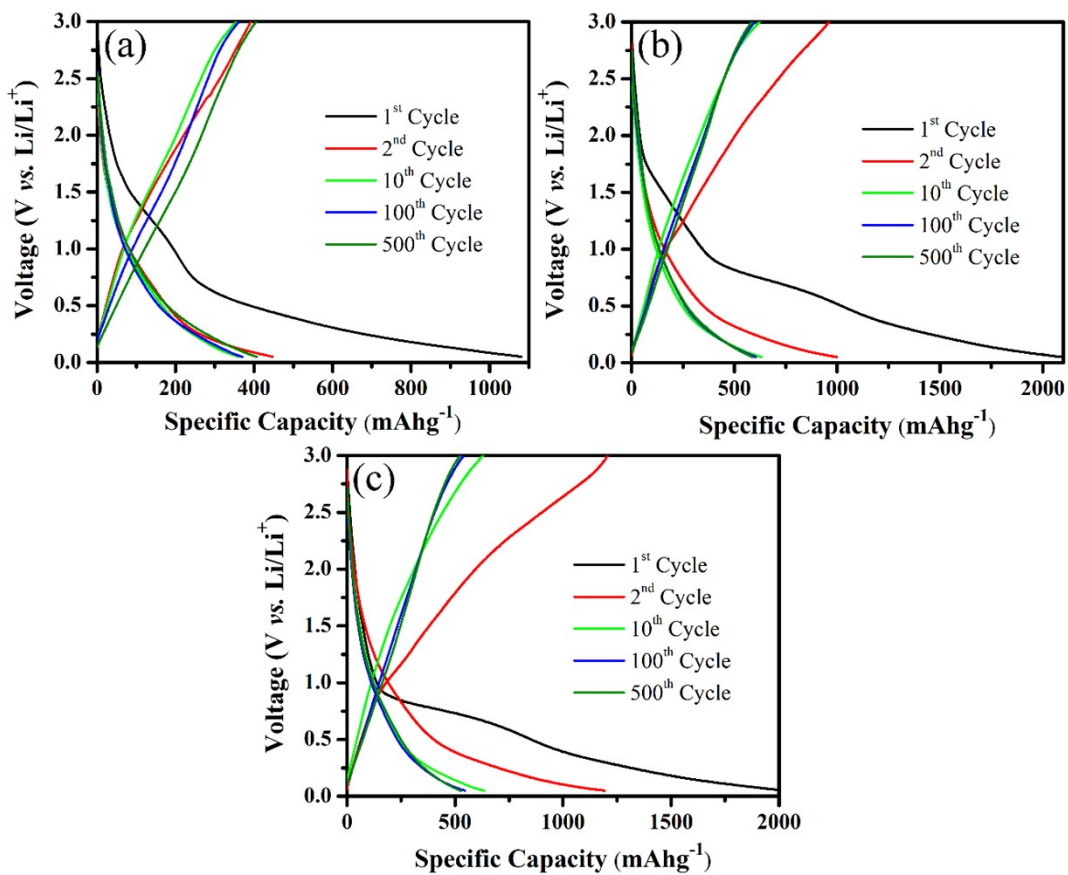


Figure S6 Shape of 1st, 2nd, 10th, 100th, and 500th charge-discharge voltage profiles of (a) FOAC1, (b) FOAC2, and (c) FOAC3 electrode.

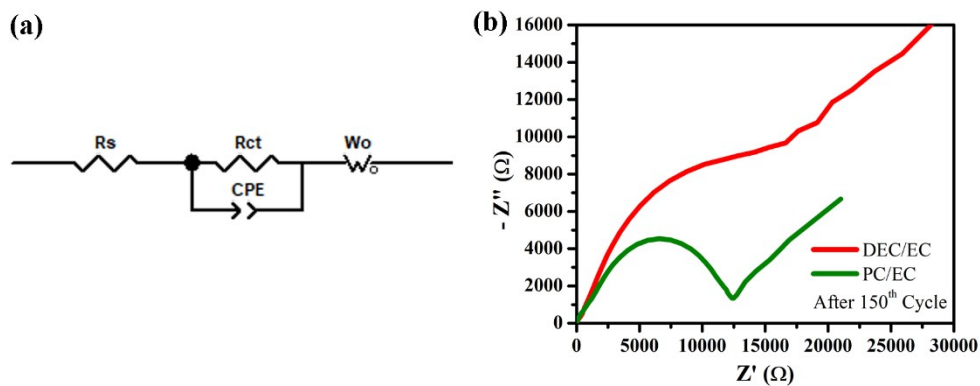


Figure S7 (a) Equivalent circuit for Nyquist plots drawn using Z-View software; R_s : Ohmic resistance, including electron and ion conductivity, R_{ct} : charge-transfer resistance of electro-chemical reactions, W_o : Warburg impedance, and CPE : Double-layer capacitance, and (b) Nyquist plots of FOAC3 electrode in DEC/EC and PC/EC based solutions against K/K^+ after 150 cycles.