

Supporting information

**Encapsulation of MoSe₂ in carbon fibers as anodes for potassium ion
batteries and nonaqueous battery-supercapacitor hybrid devices**

Qing Shen,^{a‡} Pengjie Jiang,^{a‡} Hongcheng He,^a Changmiao Chen,^a Yang
Liu^a and Ming Zhang^{*a}

- a. Key Laboratory for Micro/Nano Optoelectronic Devices of Ministry of Education, Hunan Provincial Key Laboratory of Low-Dimensional, Structural Physics & Devices, School of Physics and Electronics, Hunan University, Changsha 410082, China.

*Address correspondence to zhangming@hnu.edu.cn

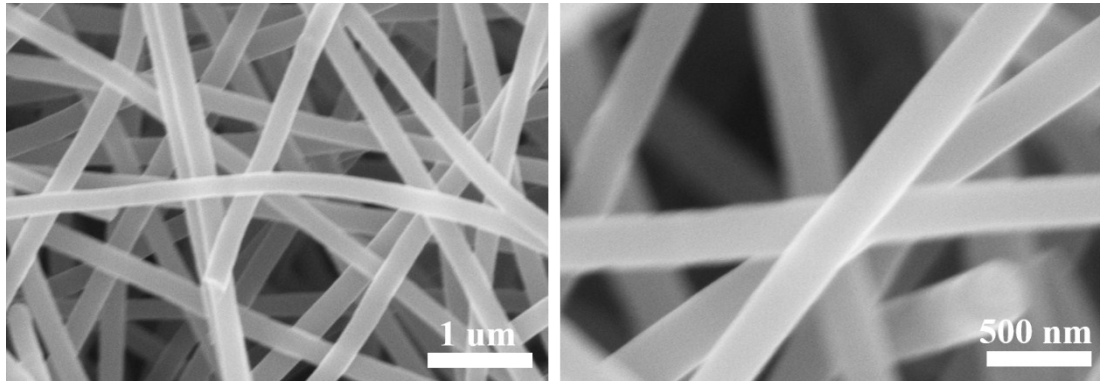


Figure S1: The SEM images of Pure Carbon nanofibers.

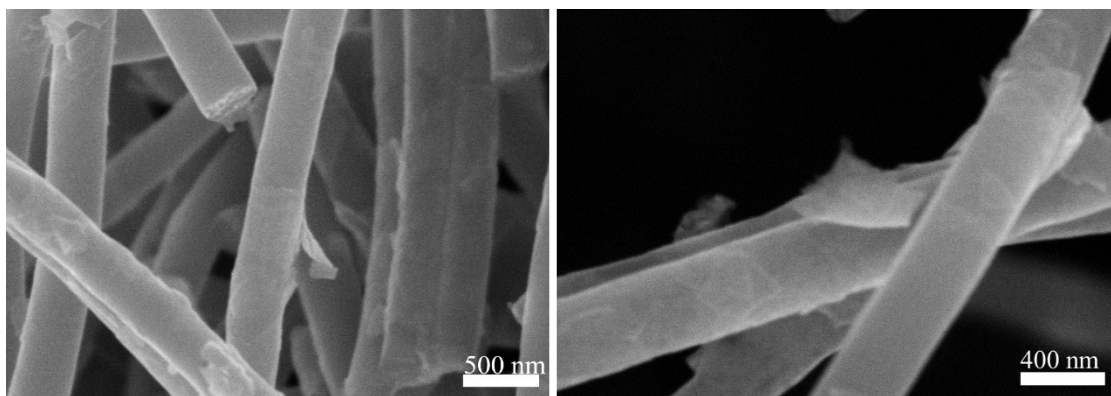


Figure S2: The SEM images of the MoSe₂/C-600

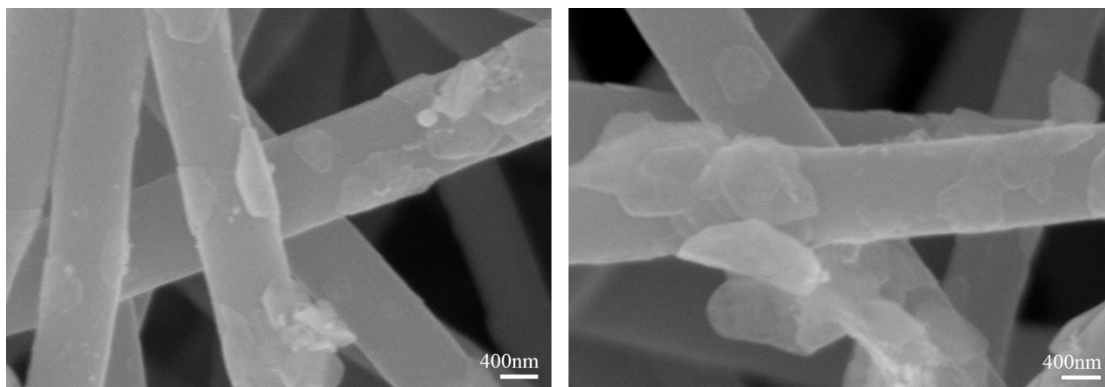


Figure S3: The SEM images of the MoSe₂/C-800

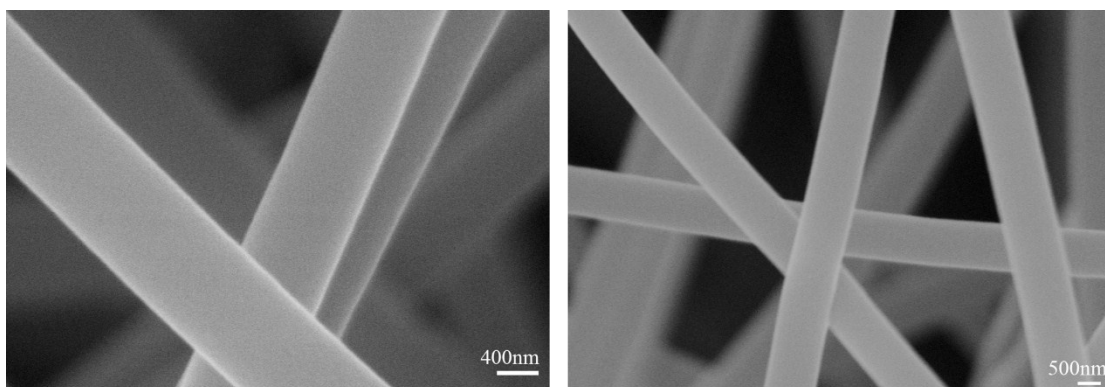


Figure S4: The SEM images of electrospinning Mo nanofibers.

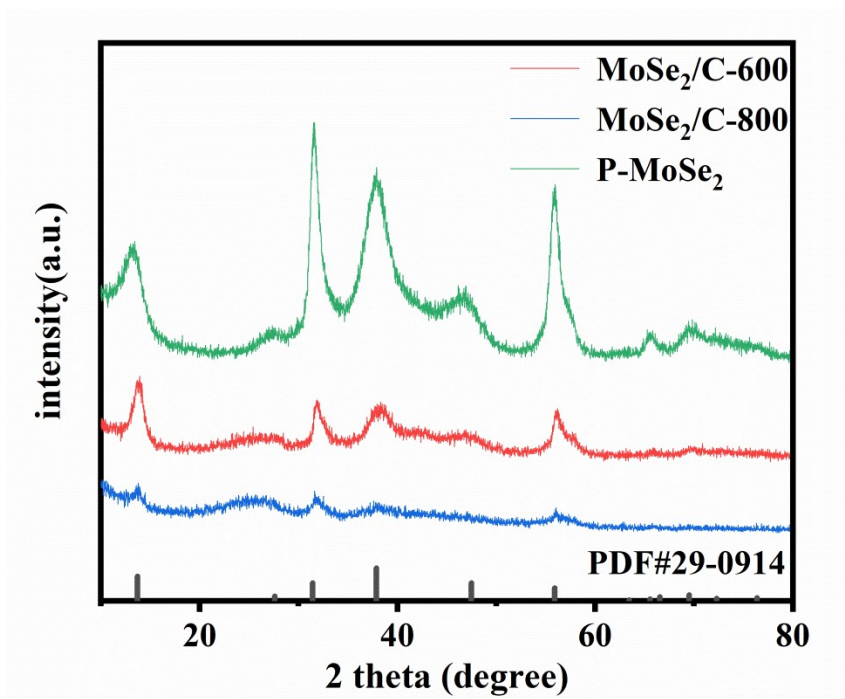


Figure S5: XRD patterns of MoSe₂/C-600, MoSe₂/C-800 and P-MoSe₂.

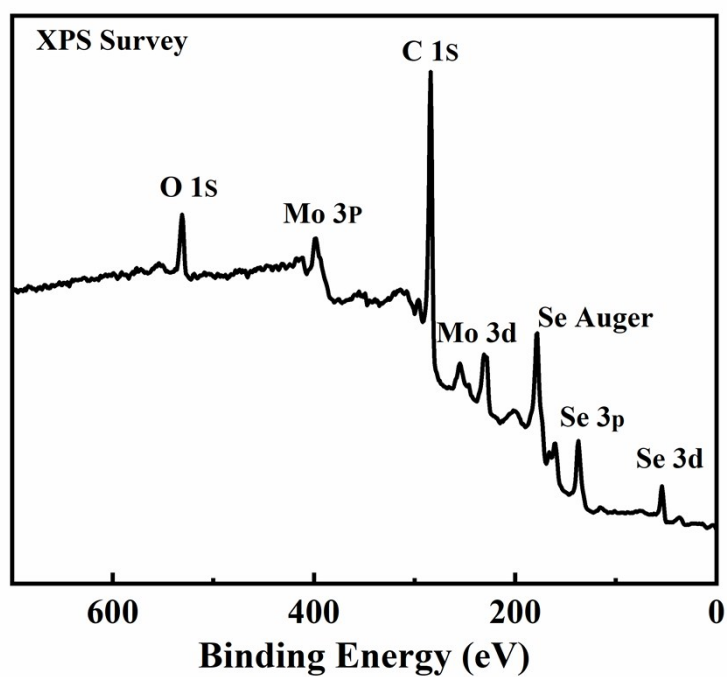


Figure S6: XPS survey spectrum of the MoSe₂/C-700.

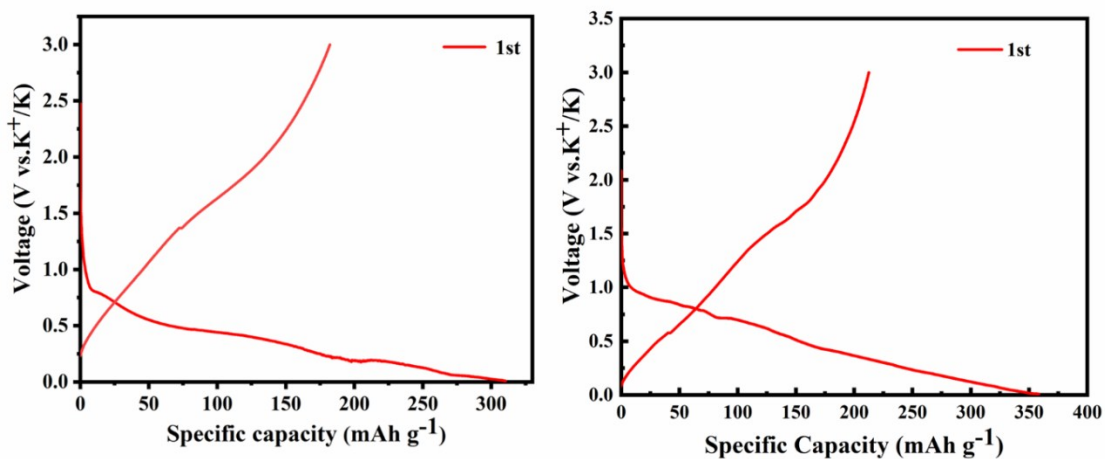


Figure S7: The initial charge/discharge profiles of MoSe₂/C-600 and MoSe₂/C-800.

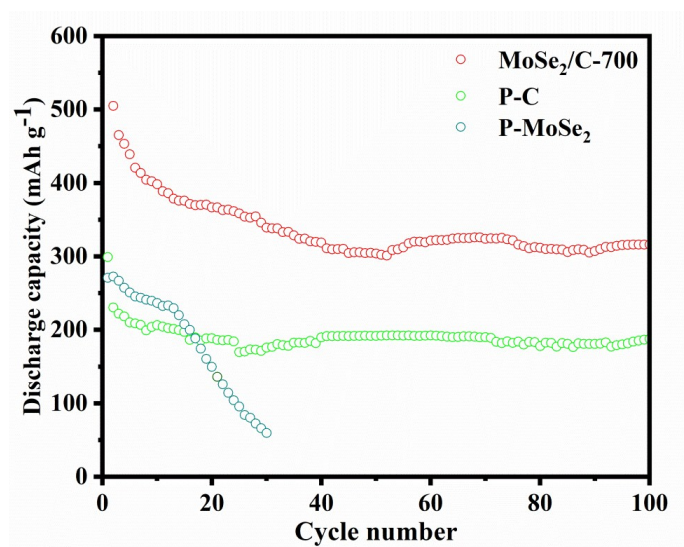


Figure S8: Cycling performance of MoSe₂/C-700, P-C and P-MoSe₂.

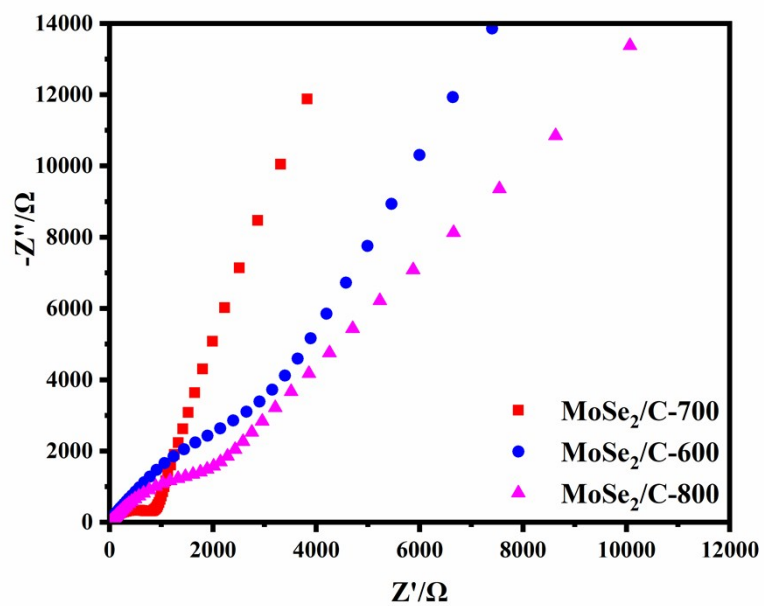


Figure S9: The EIS spectra and the equivalent circuit model of MoSe₂/C-600, MoSe₂/C-700 and MoSe₂/C-800.

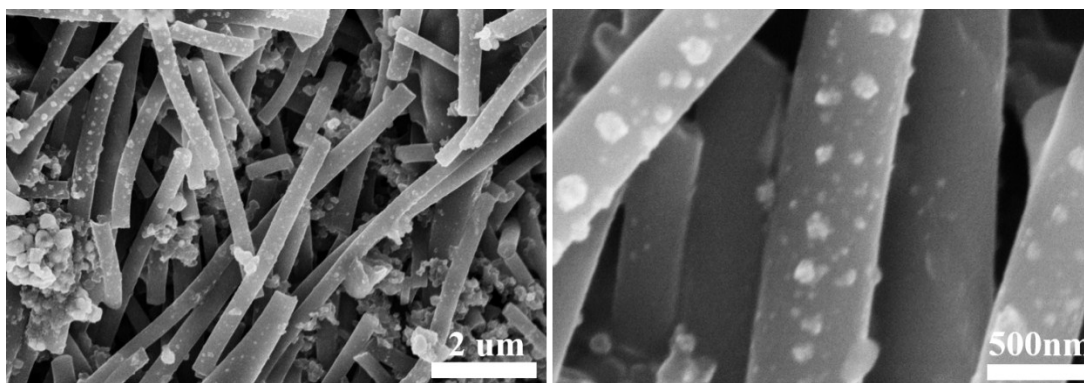


Figure S10: The images of the MoSe₂/C-700 electrode after cycling for 100 cycles at 100 mA g⁻¹ in KIBs.

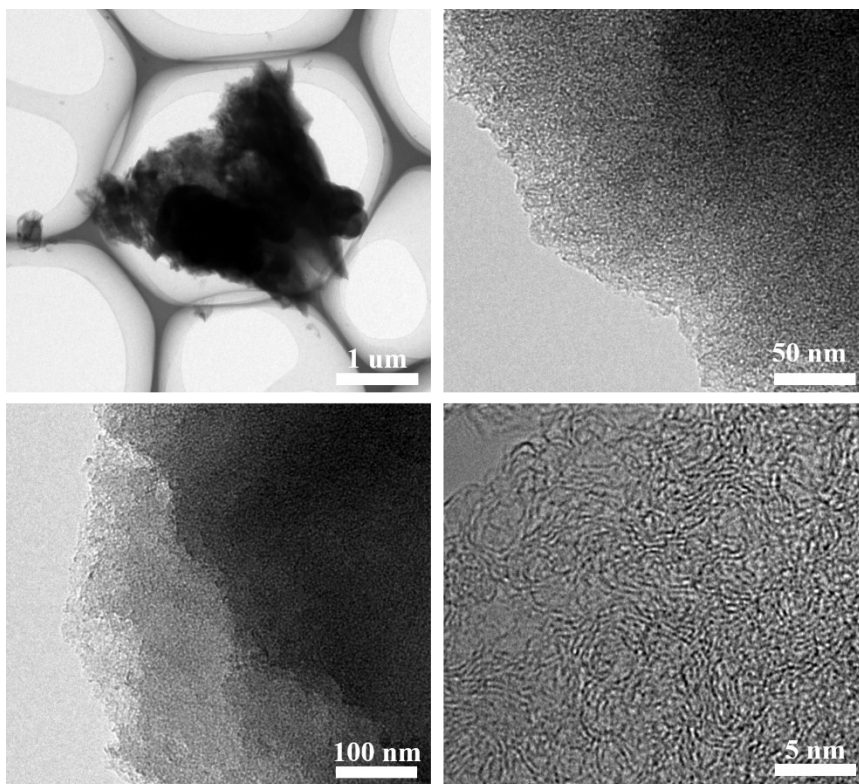


Figure S11: TEM and HRTEM images of Carbon Active.

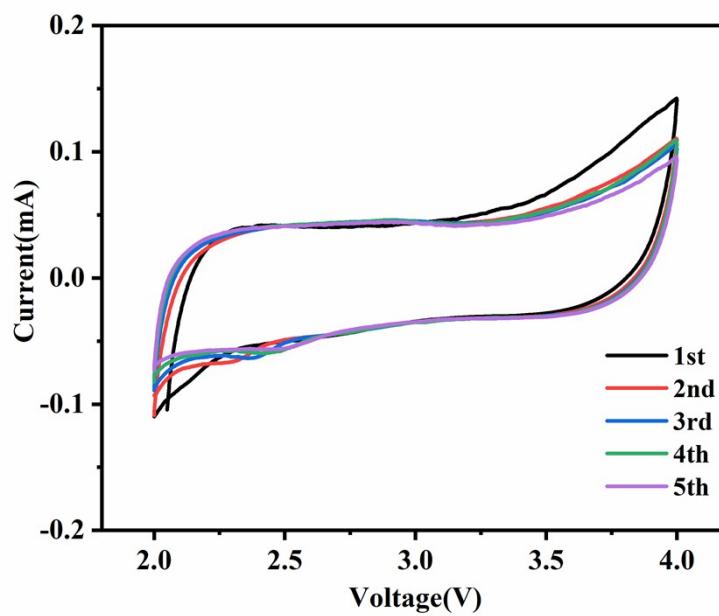


Figure S12: CV curve of active carbon in KIB measured at 0.2 mV s^{-1} in the voltage range of 2.0 - 4.0 V.

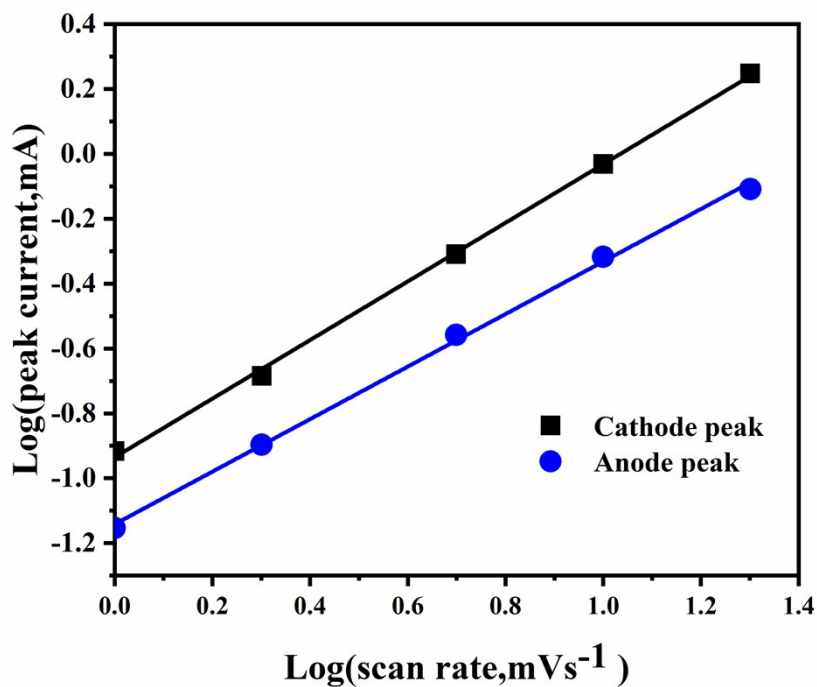


Figure S13: corresponding log i versus log v plots at each redox peak (peak current: i , scan rate: v) of BSH.

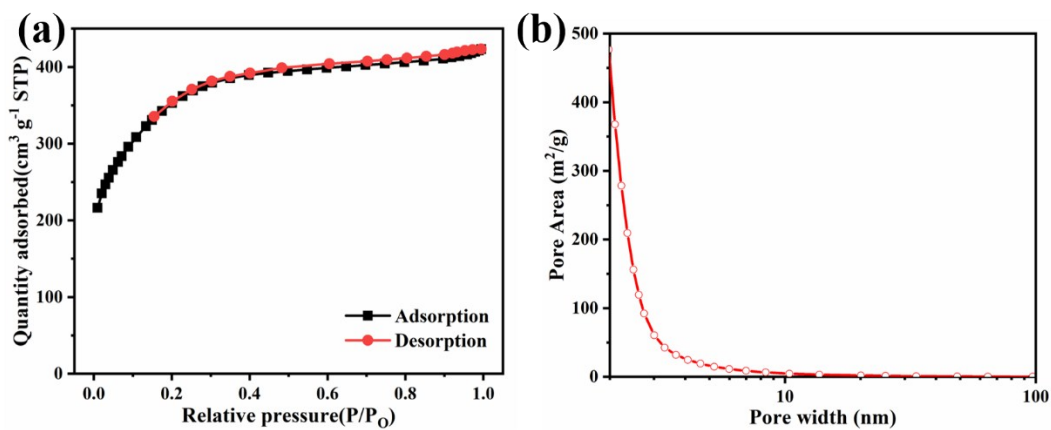


Figure S14: a): Nitrogen adsorption/desorption isotherm; b): pore-size distribution curves of powdery AC.

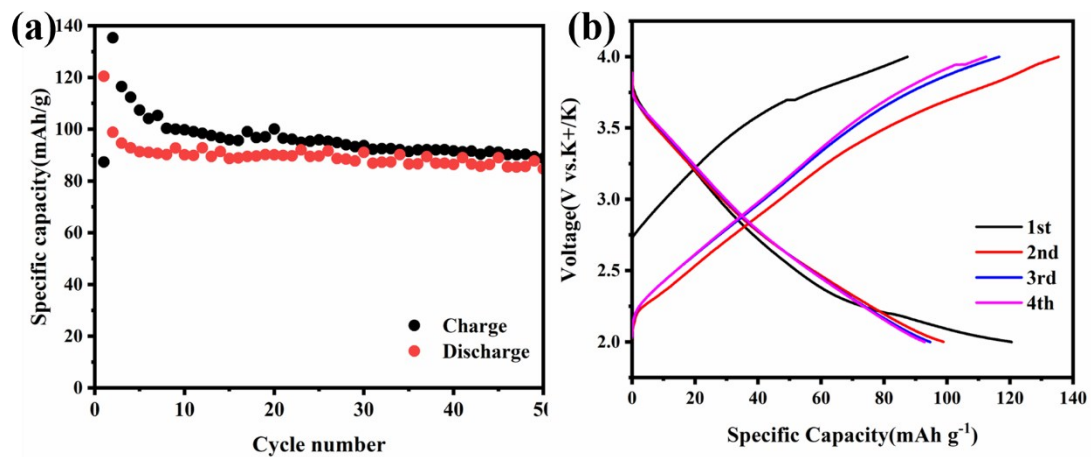


Figure S15: a): Cycling performance of AC at a current density 50 mA g⁻¹; b) the first four GCD curves at the current density of 50 mA g⁻¹.