

Supporting Information

**A simple fabrication porous carbon electrode material by one-step carbonization  
and activation of poly (vinyl alcohol) hydrogel**

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**Fig. S1** SEM images of the unannealed PVA-H sample (a, b).

**Fig. S2** Electrochemical performance of PVA secondary annealed C. (a) CV curves at different scan rates, (b) charge–discharge curves at different current densities, (c) Nyquist plots and (d) specific capacitance.

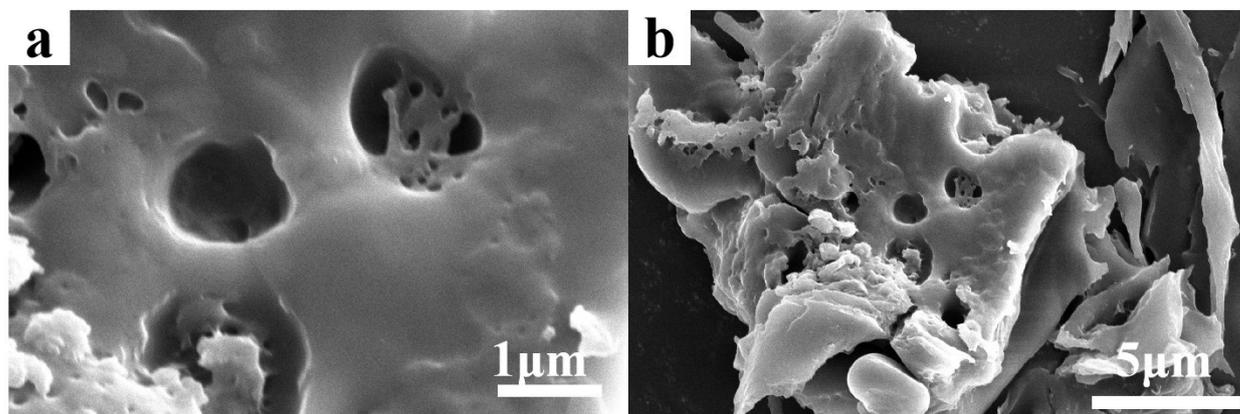
**Fig. S3** The SEM characterizations of PVA at concentrations below 5% (a, b) and above 15% (c, d)

**Fig. S4** (a) curves of electric double-layer capacitance intervals with different scan rates of 5% PVA-H, (b) ECSA values of 5% PVA-H electrodes

**Fig. S5** (a) curves of electric double-layer capacitance intervals with different scan rates of 10% PVA-H, (b) ECSA values of 10% PVA-H electrodes

**Fig. S6** (a) curves of electric double-layer capacitance intervals with different scan rates of 15% PVA-H, (b) ECSA values of 15% PVA-H electrodes.

**Fig. S7** XRD patterns of 5% PVA-H after cycling tests



**Fig. S1** SEM images of the unannealed PVA-H sample (a, b).

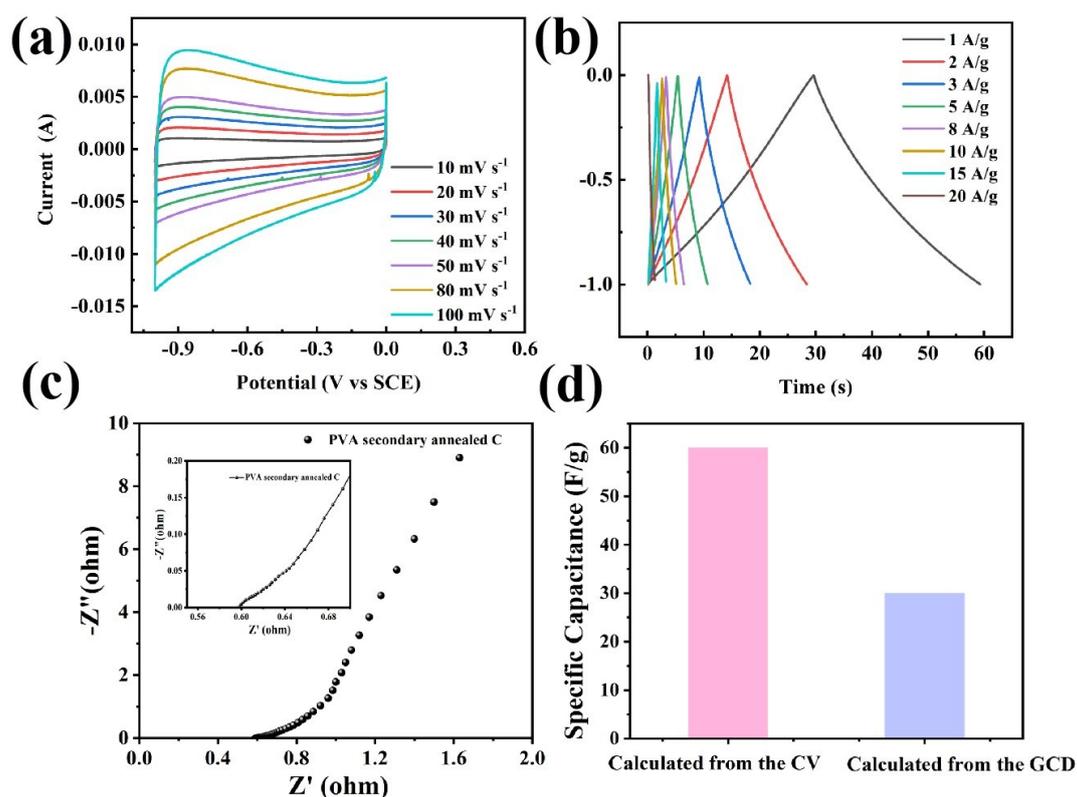


Fig. S2 Electrochemical performance of PVA secondary annealed C. (a) CV curves at different scan rates, (b) charge–discharge curves at different current densities, (c) Nyquist plots and (d) specific capacitance.

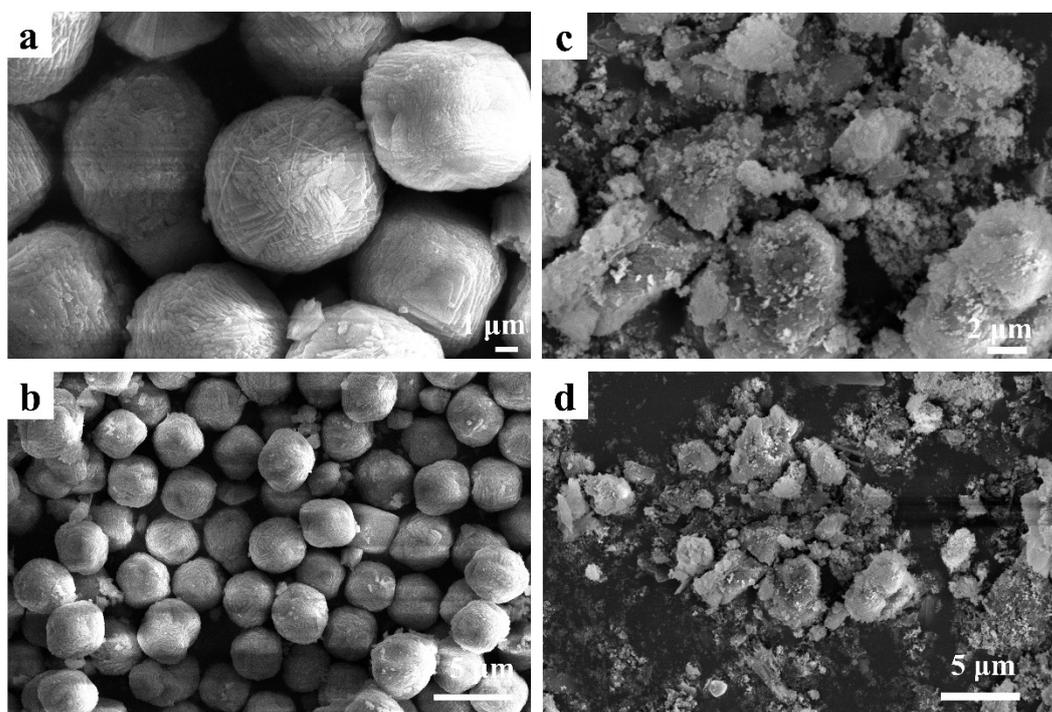


Fig. S3 The SEM characterizations of PVA at concentrations below 5% (a, b) and

above 15% (c, d)

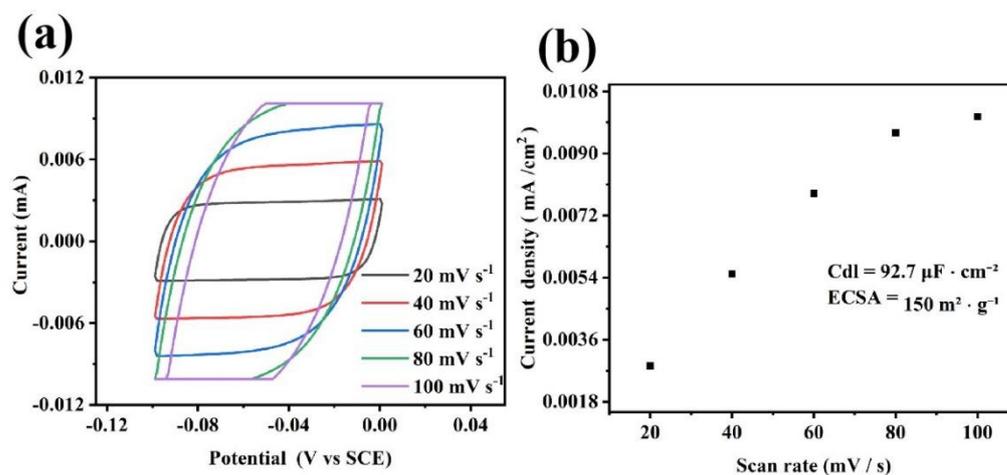


Fig. S4 CV curves (a) and ECSA data (b) of 5% PVA-H sample.

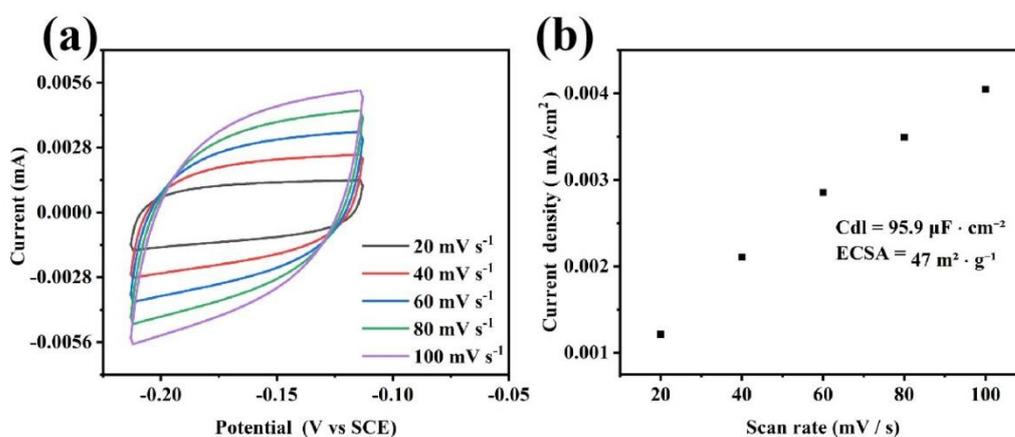


Fig. S5 CV curves (a) and ECSA data (b) of 10% PVA-H sample.

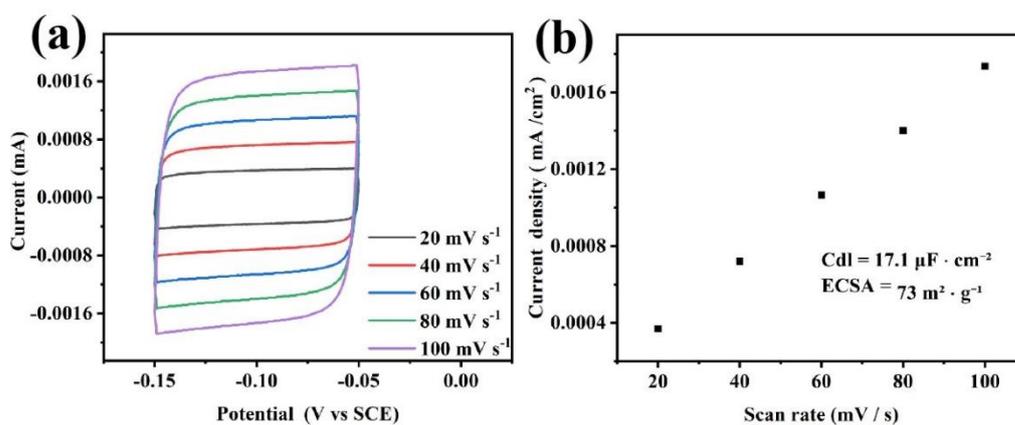


Fig. S6 CV curves (a) and ECSA data (b) of 15% PVA-H sample.

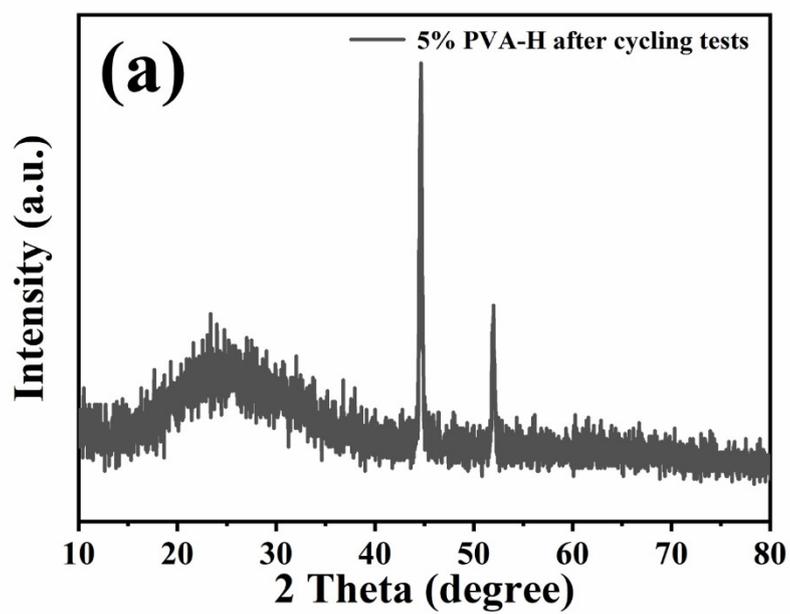


Fig. S7 XRD patterns of 5% PVA-H after cycling tests