Support Information

Biomass-Derived Hard Carbon Anodes from Setaria viridis for Na-Ion Batteries

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Three biomass materials were directly pyrolyzed under different atmospheres to estimate the approximate proportion of their components. All samples were weighed before and after carbonization. Pyrolysis was carry out in a tube furnace at 900°C for 1 h under air or Ar atmosphere with a heating rate of 5 °C/min.

Table S1.The rough components ratios of three biomass materials after carbonized.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| atmosphere  biomass | Air (after/before) | Ar (after/before) | char yeild | ash ratio |
| Setaria viridis | 0.0192/0.5554 | 0.0372/0.6010 | 2.7% | 3.5% |
| Palm kernel shell | 0.0124/0.7965 | 0.2795/1.1323 | 23% | 1.6% |
| Fir sawdust | 0.0017/0.4443 | 0.0488/0.5592 | 8.3% | 0.4% |

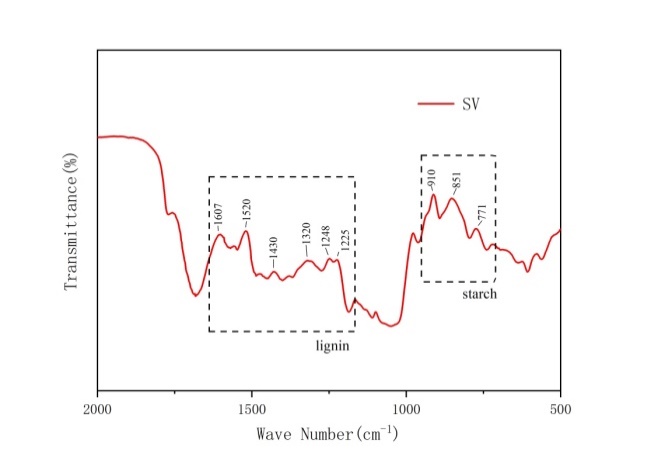


Figure S1. Fourier-transform infrared (FTIR) spectrum of untreated Setaria viridis biomass.

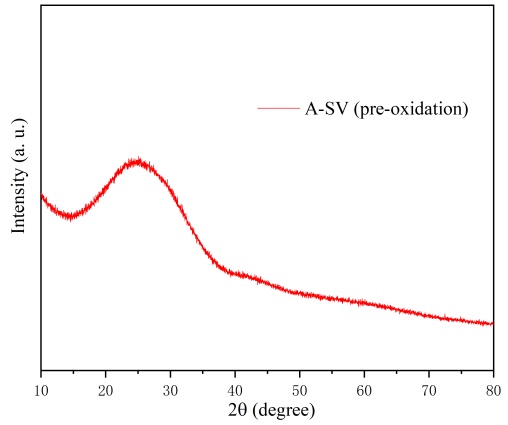


Figure S2. XRD spectrum of pre-oxidized A-SV.

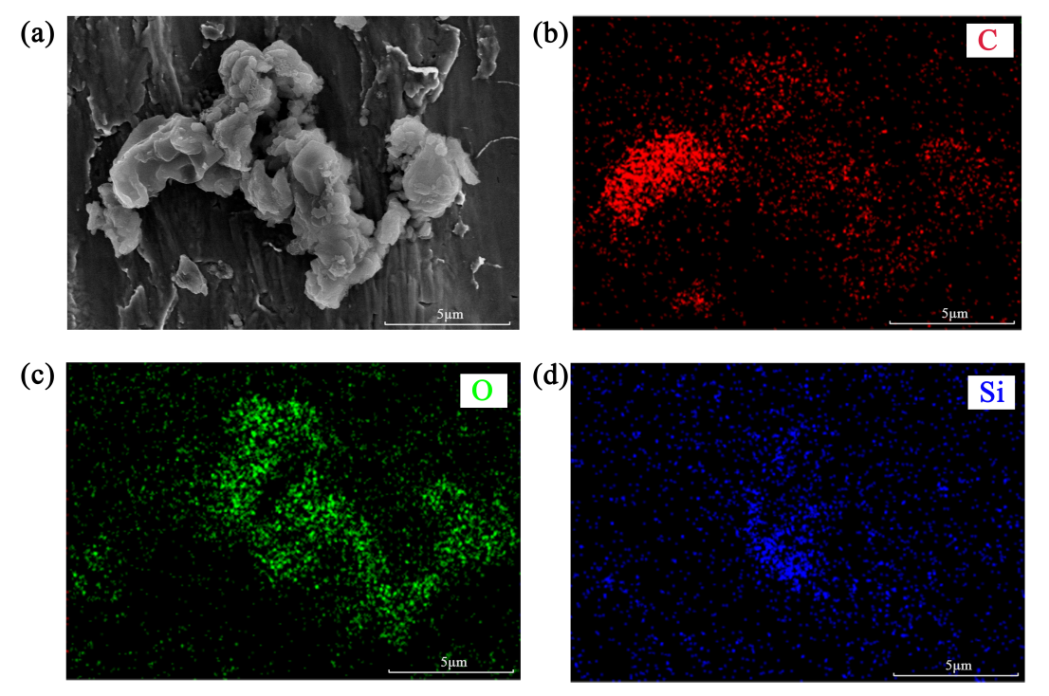


Figure S3. (a): The SEM image of SV-300; (b, c, d): Corresponding EDS C, O and Si element maps of SV-300, respectively.

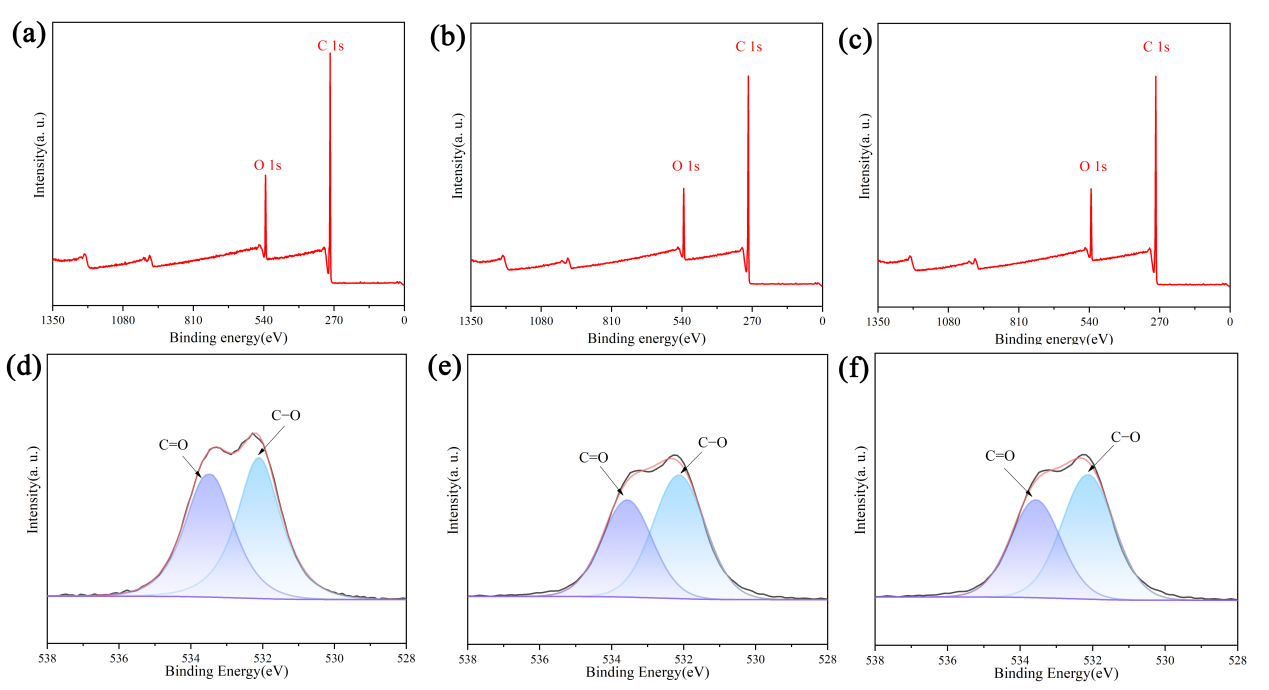


Figure S4. (a, b, c) XPS spectra of SV-300, SV-300h, SV-300n, respectively. (d, e, f) O1s spectra of SV-300, SV-300h, SV-300n, respectively.

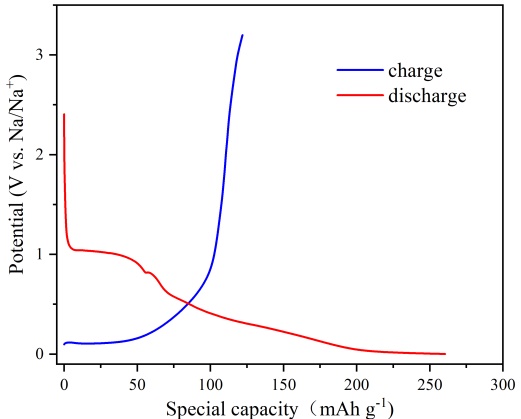


Figure S5. Charge/Discharge of another SV-300 sample.

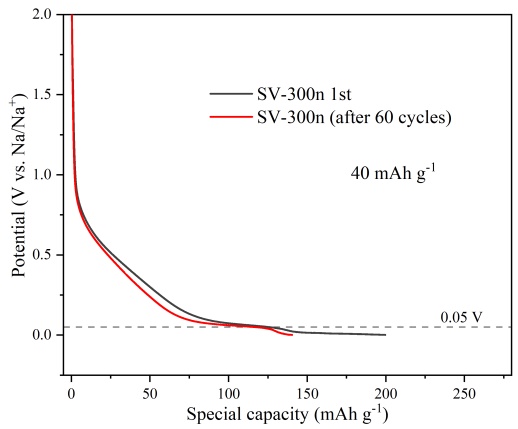


Figure S6. The change in discharging curve of SV-300n after 60 cycles.

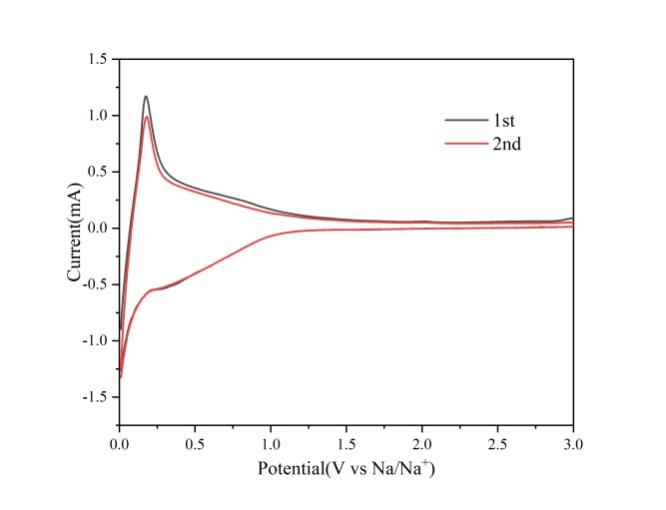


Figure S7. The CV curve of SV-300n at 0.1 mV s-1.

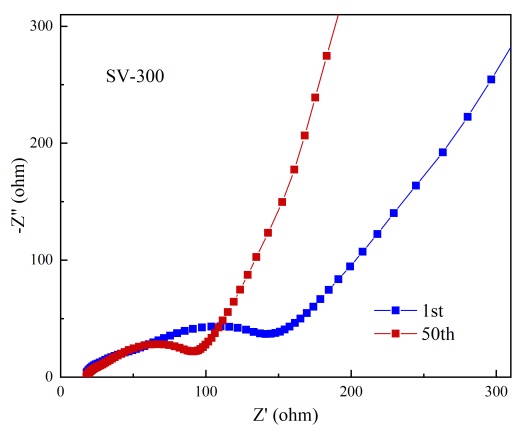


Figure S8. The change in impedance with cycles of SV-300.