

## Electronic Supplementary Material

## Aerosol synthesis of trivalent titanium doped titania/carbon composite microspheres with superior sodium storage performance

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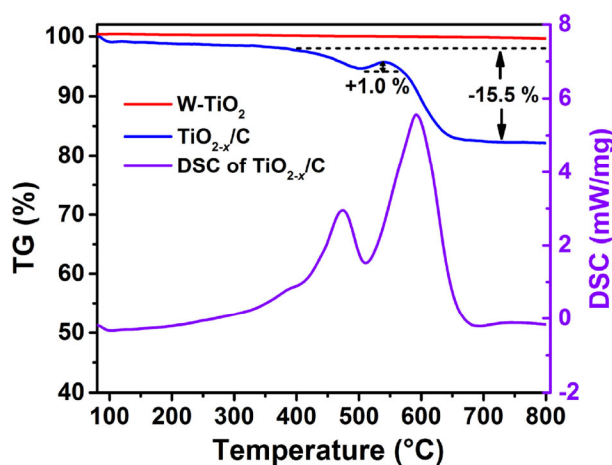
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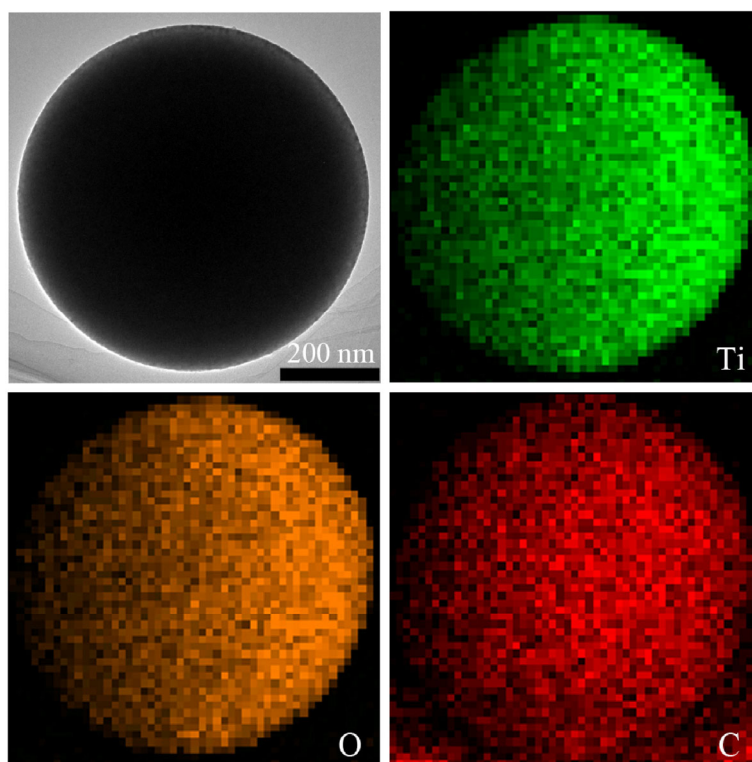
**Table S1** Unit cell parameters of  $\text{TiO}_{2-x}/\text{C}$  and  $\text{W-TiO}_2$  derived from XRD data

| Sample                      | Cell parameter $a, b/\text{Å}$ ( $a=b$ ) | Cell parameter $c$ (Å) | Cell volume ( $\text{Å}^3$ ) |
|-----------------------------|--|------------------------|------------------------------|
| $\text{TiO}_{2-x}/\text{C}$ | 3.8110                                   | 9.5189                 | 138.2498                     |
| $\text{W-TiO}_2$            | 3.7857                                   | 9.5175                 | 136.4003                     |

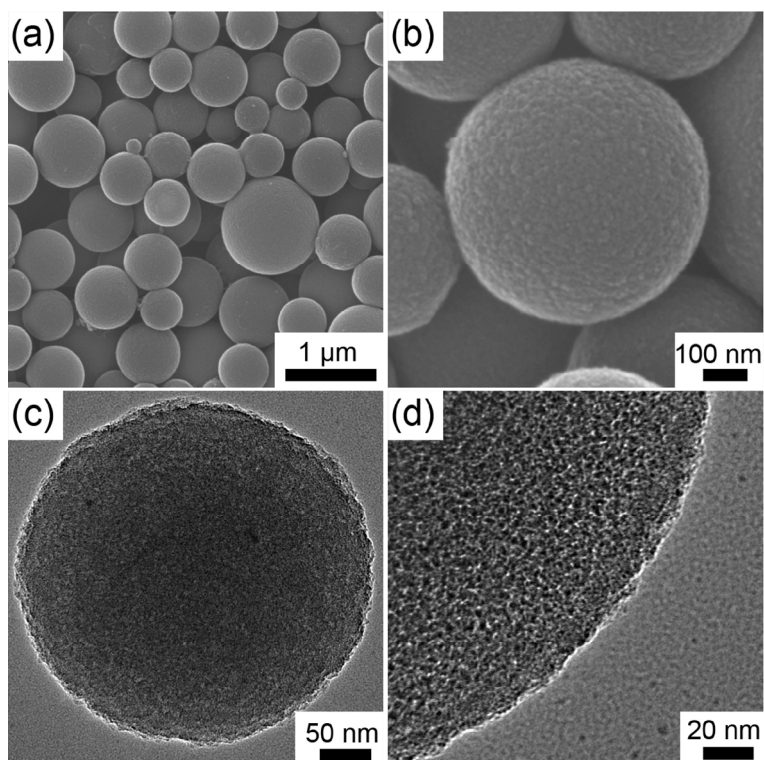


**Figure S1** TG and DSC curves of  $\text{TiO}_{2-x}/\text{C}$  and  $\text{W-TiO}_2$ .

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**Figure S2** Elemental mapping results of  $\text{TiO}_{2-x}/\text{C}$ .



**Figure S3** SEM (a) and (b) and TEM (c) and (d) images of the carbon matrix prepared by etching the  $\text{TiO}_{2-x}/\text{C}$  with HF.

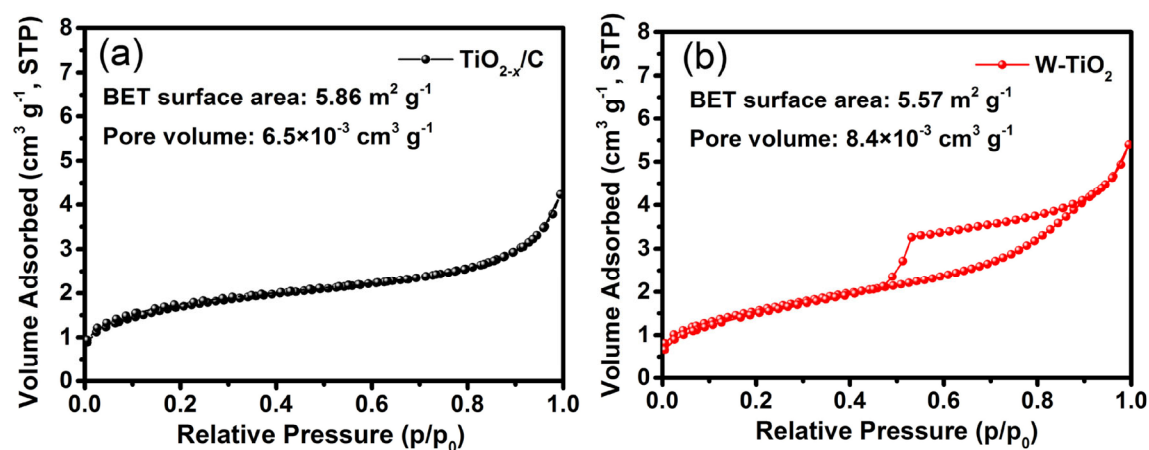


Figure S4  $N_2$  adsorption–desorption isotherms of  $\text{TiO}_{2-x}/\text{C}$  and  $\text{W-TiO}_2$ .

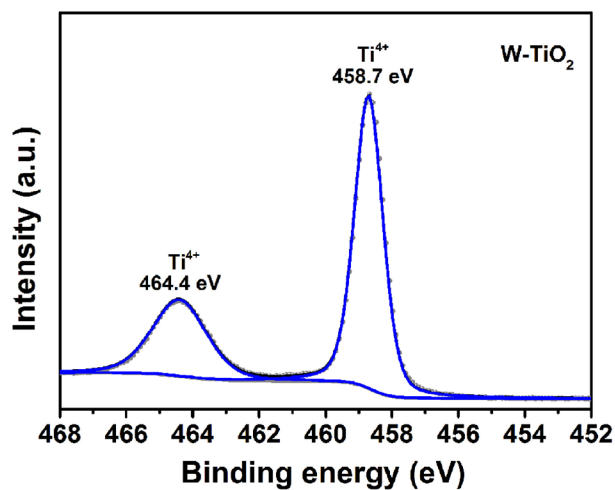


Figure S5 High-resolution Ti 2p XPS spectrum of  $\text{W-TiO}_2$ .

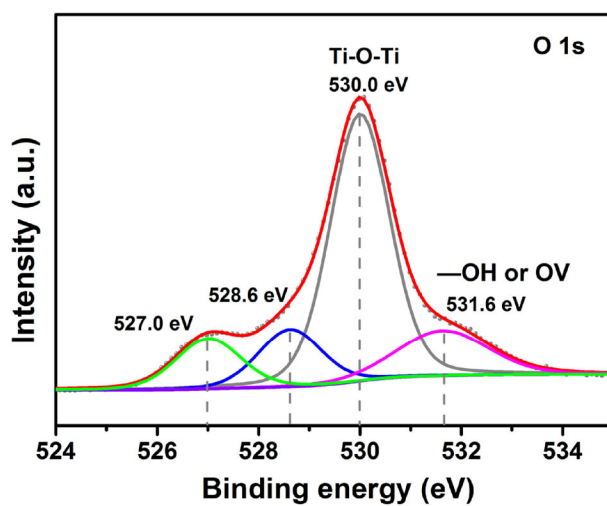
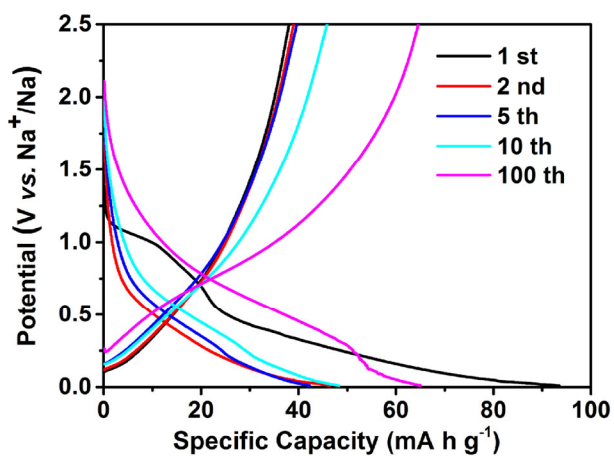
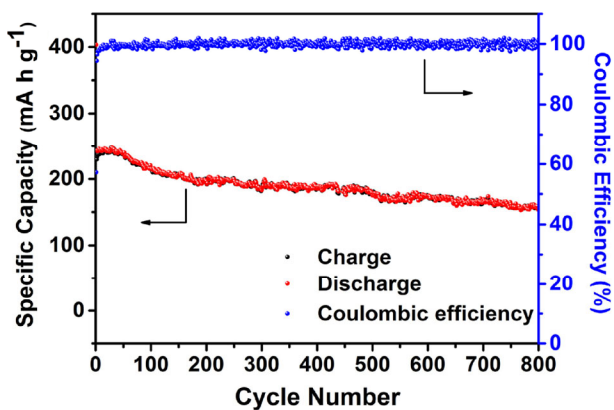


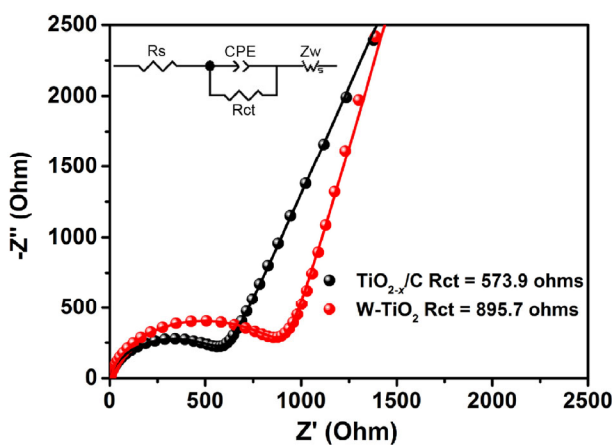
Figure S6 High-resolution O 1s XPS spectrum of  $\text{TiO}_{2-x}/\text{C}$ .



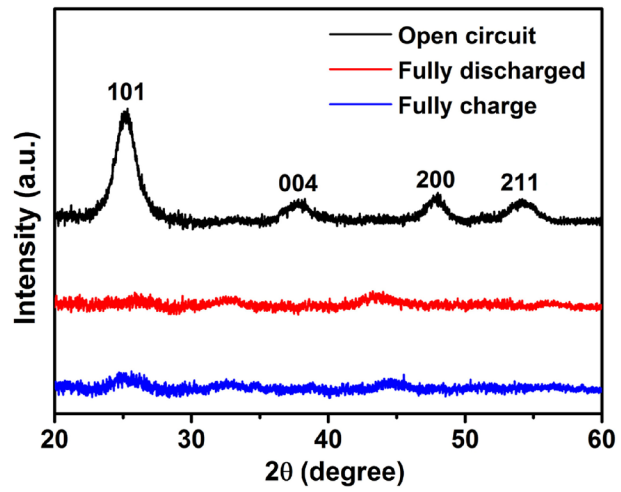
**Figure S7** Selected galvanostatic charge-discharge profiles of W-TiO<sub>2</sub> at a current density of 50 mA·g<sup>-1</sup>.



**Figure S8** The cycling performance of TiO<sub>2-x</sub>/C from 1st to 800th cycle at a current density of 100 mA·g<sup>-1</sup>.



**Figure S9** The electrochemical impedance spectra of TiO<sub>2-x</sub>/C and W-TiO<sub>2</sub>.



**Figure S10** *Ex-situ* XRD patterns of  $\text{TiO}_{2-x}/\text{C}$  at different states: the open-circuit, fully discharged and fully charged states.