Electronic Supplementary Material

Carbon-supported and nanosheet-assembled vanadium oxide microspheres for stable lithium-ion battery anodes

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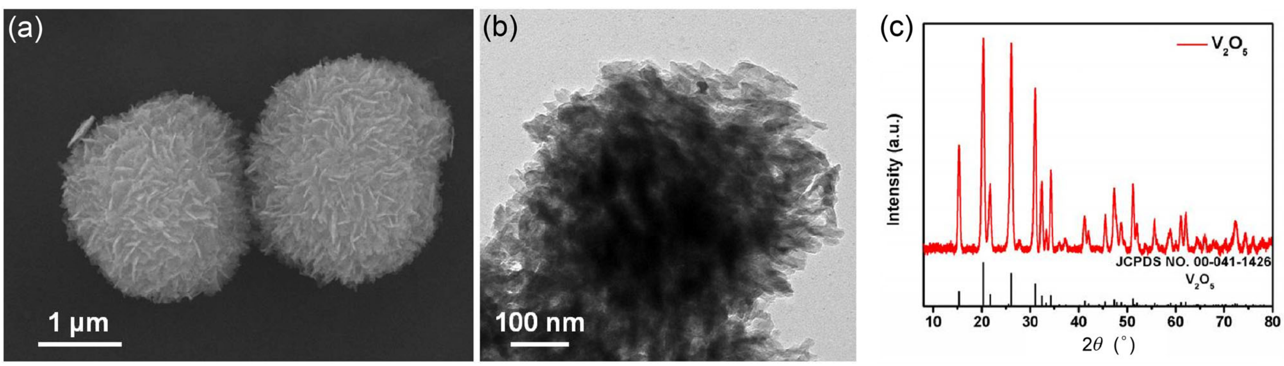

Figure S1 SEM image (a), TEM image (b) and XRD pattern (c) of V_2O_5 microspheres assembled with nanosheets, which is obtained after sintering in air.

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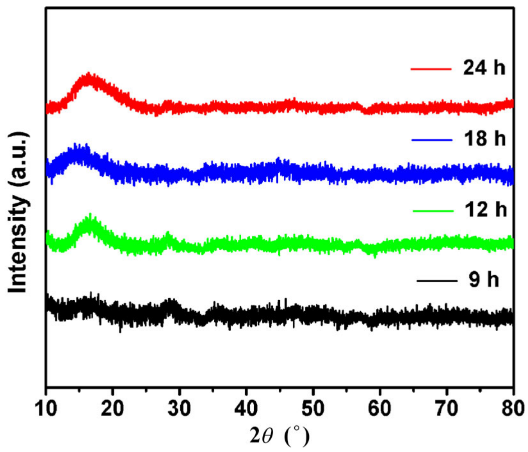

Figure S2 XRD patterns of carbon-supported and nanosheet-assembled amorphous vanadium oxide microspheres prepared at 9, 12, 18 and 24 h, respectively.

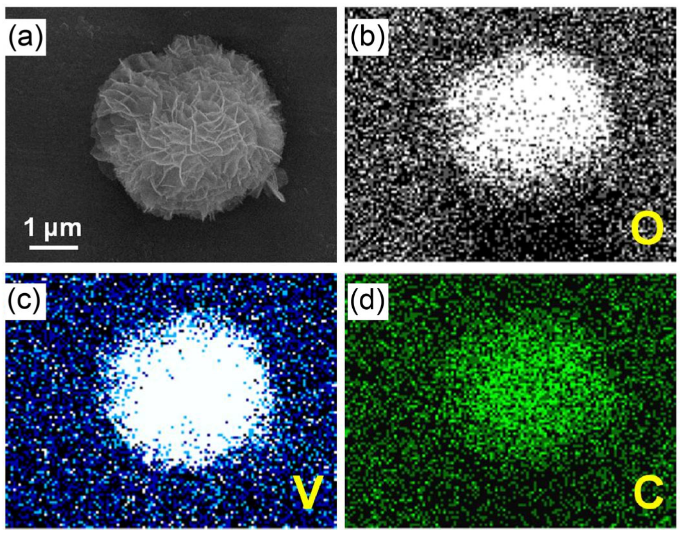

Figure S3 SEM image (a) and EDS elemental mappings of carbon-supported and nanosheet-assembled amorphous vanadium oxide microspheres. The elements of oxygen (b), vanadium (c), and carbon (d) are characterized, respectively.

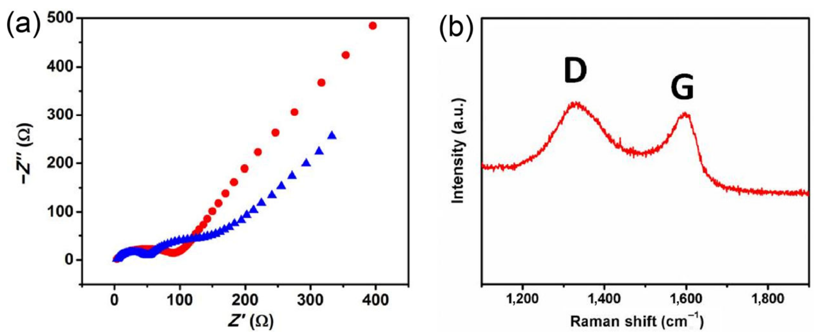

Figure S4 (a) AC impedance plots of amorphous vanadium oxide microspheres (red) and crystalline V_2O_3 microspheres (blue), respectively. (b) Raman spectra of crystalline V_2O_3 microspheres.

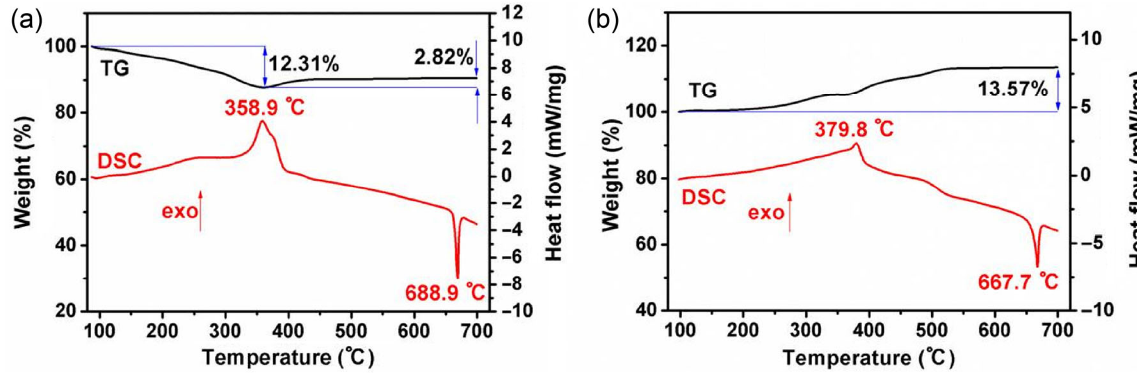

Figure S5 TG (black line) and DSC (red line) of amorphous vanadium oxide microspheres (a) and crystalline V_2O_3 microspheres (b), respectively.

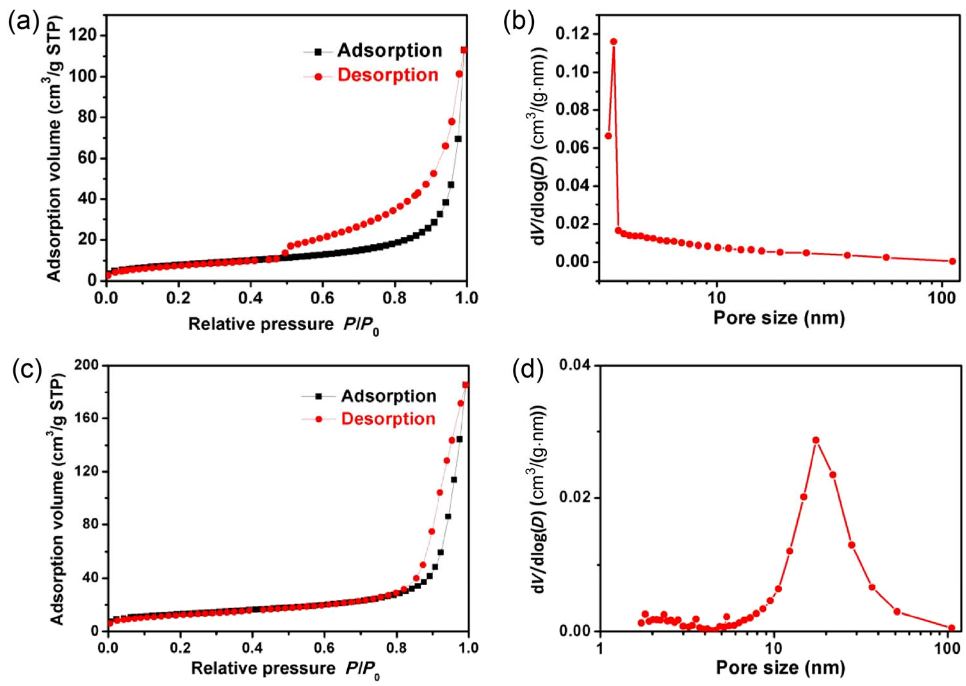

Figure S6 (a) and (b) Nitrogen adsorption-desorption isotherms and the corresponding pore size distribution of amorphous vanadium oxide microspheres; (c) and (d) nitrogen adsorption-desorption isotherms and the corresponding pore size distribution of crystalline V_2O_3 microspheres.

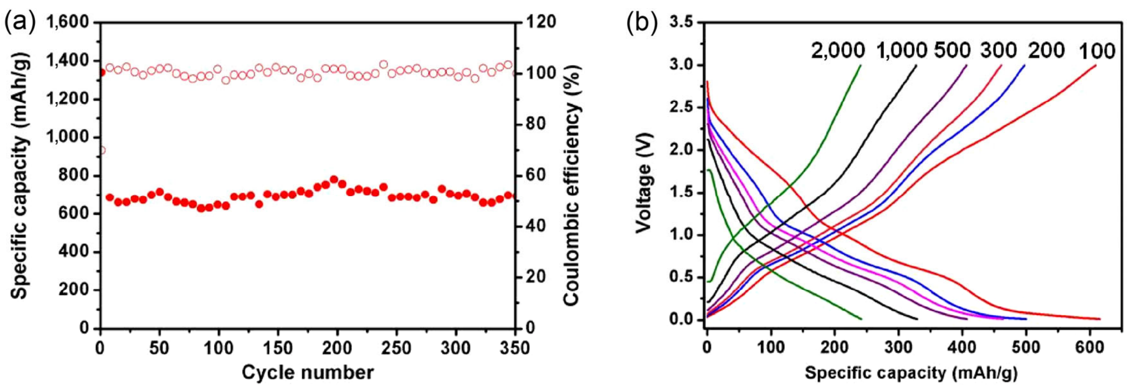

Figure S7 (a) Cycling performance and Coulombic efficiency of amorphous vanadium oxide microspheres tested at 100 mA/g. (b) Charge-discharge curves of amorphous vanadium oxide microspheres tested at different current densities ranging from 100 to 200, 300, 500, 1,000, 2,000 mA/g, respectively.

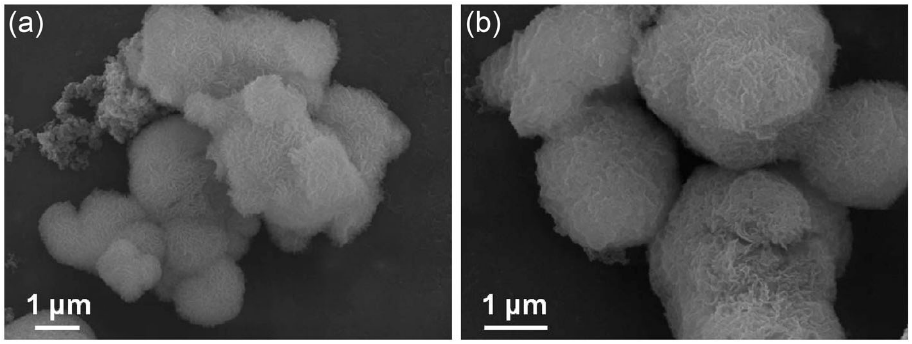

Figure S8 SEM images of amorphous vanadium oxide microspheres (a) and crystalline V_2O_3 microspheres (b) after cycling 400 times at the current density of 200 mA/g.

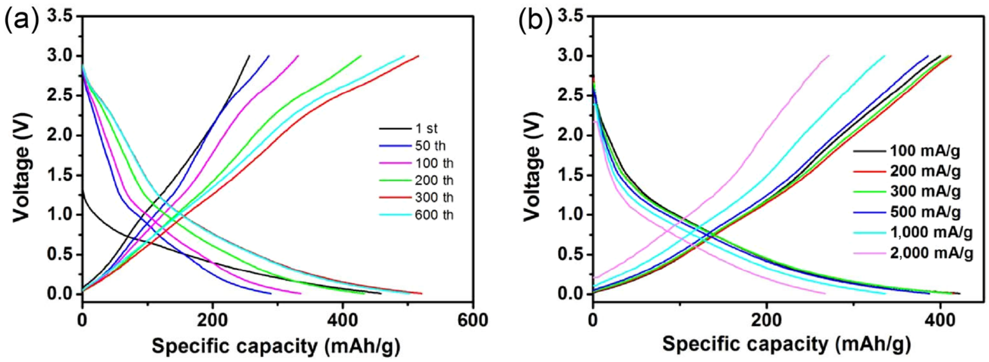

Figure S9 (a) The voltage profiles of crystalline V_2O_3 microspheres tested at the current density of 200 mA/g. (b) The charge and discharge curves of crystalline V_2O_3 microspheres tested at different current densities ranging from 100 to 2,000 mA/g.

Table S1 The comparisons of our work and previously reports

Morphology	Voltage range (V)	Current density (mA/g)	The 2^{nd} discharge capacity (mAh/g)	Cycle number	Capacity retention	Reference
Carbon supported amorphous vanadium oxide microspheres	0.01–3.0	2,000	345	7,000	95%	Our work
Carbon supported V_2O_3 microspheres	0.01–3.0	2,000	245	9,000	98%	
Amorphous vanadium coating on graphene	0.01–3.0	1,000	500	200	101%	*Chem. Commun.* **2014**, *50*, 10703.
Amorphous vanadium pentoxide	0.01–3.0	100	650	50	92%	*Chem. Mater.* **2014**, *26*, 5874.
V_2O_3-ordered mesoporous carbon	0.01–3.0	100	700	180	75%	*Carbon* **2013**, *62*, 382.
V_2O_3/C nanocomposites	0.01–3.0	200	750	100	93%	*J. Power Sources* **2014**, *261*, 184.