Electronic Supplementary Material

Three-dimensional porous V_2O_5 hierarchical octahedrons with adjustable pore architectures for long-life lithium batteries

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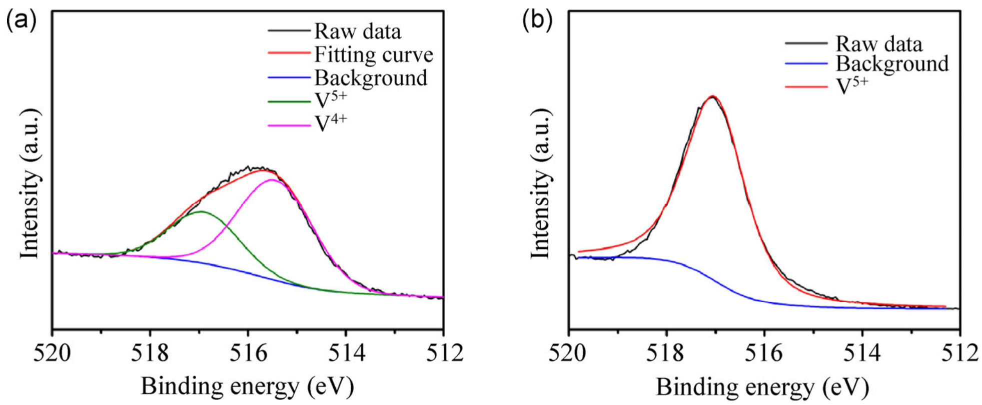

Figure S1 The XPS spectrum of (a) AVO octahedrons and (b) 3D porous V_2O_5 octahedrons calcined at 500 °C

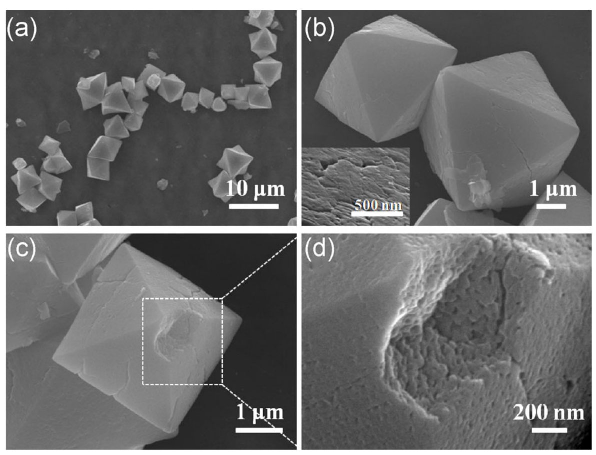

Figure S2 FESEM images of the porous V_2O_5 octahedrons calcined at 350 °C.

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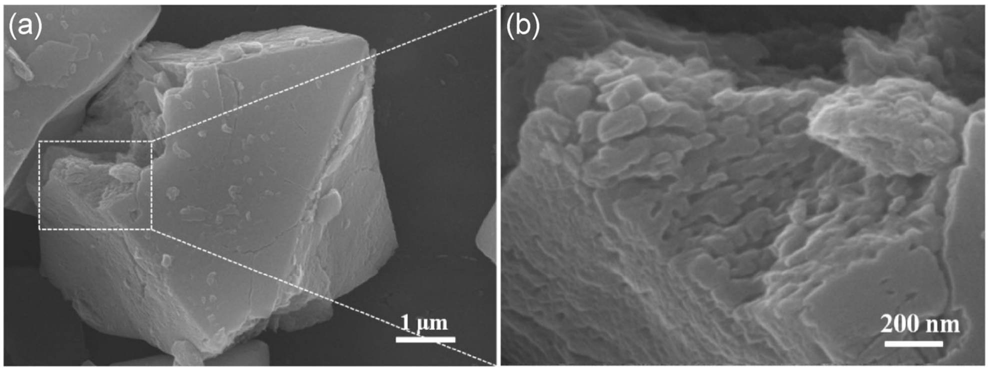

Figure S3 The fracture surface images of broken octahedron particles.

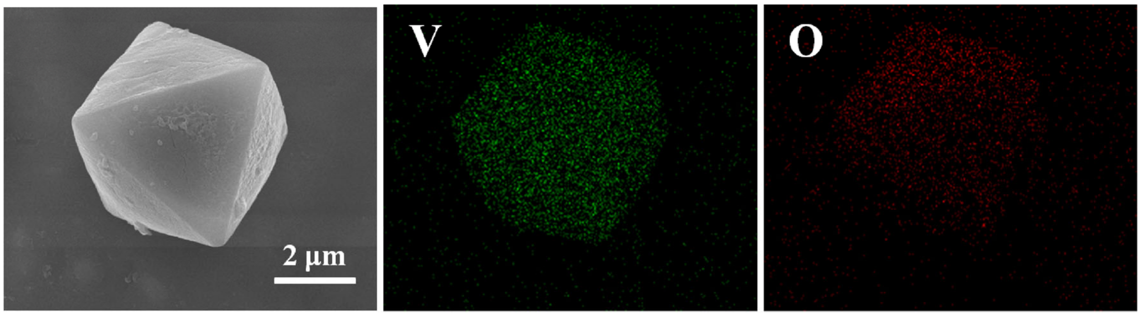

Figure S4 EDS mapping of the 3D porous V_2O_5 octahedrons annealed at 500 °C.

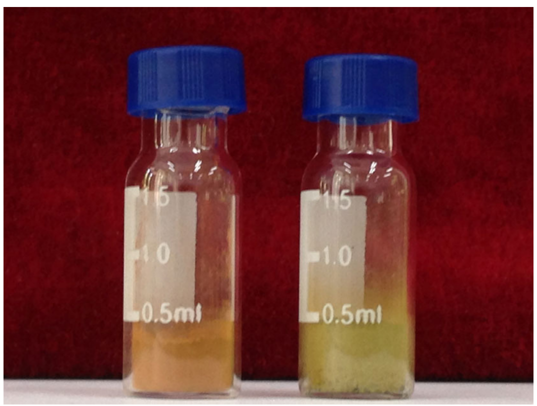

Figure S5 Pictures of the 3D porous V_2O_5 octahedrons (left) and V_2O_5 nanowires (right). Each vial contains 0.3765 g of tightly packed product.

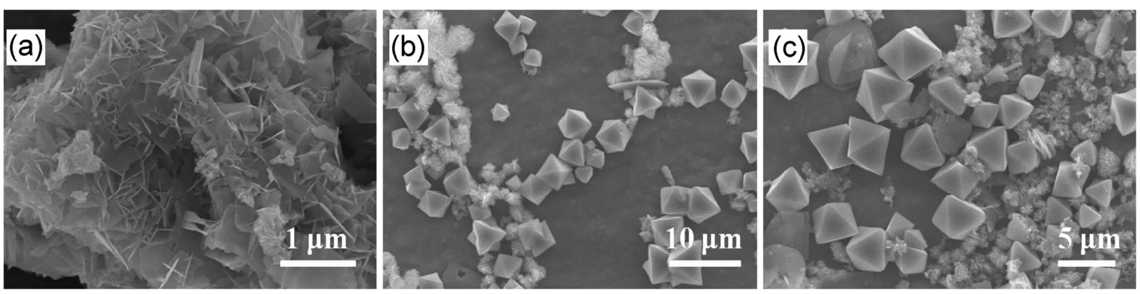

Figure S6 FESEM images of the products after solvothermal reaction with 0 g (a), 1 g (b) and 2 g (c) of urea.

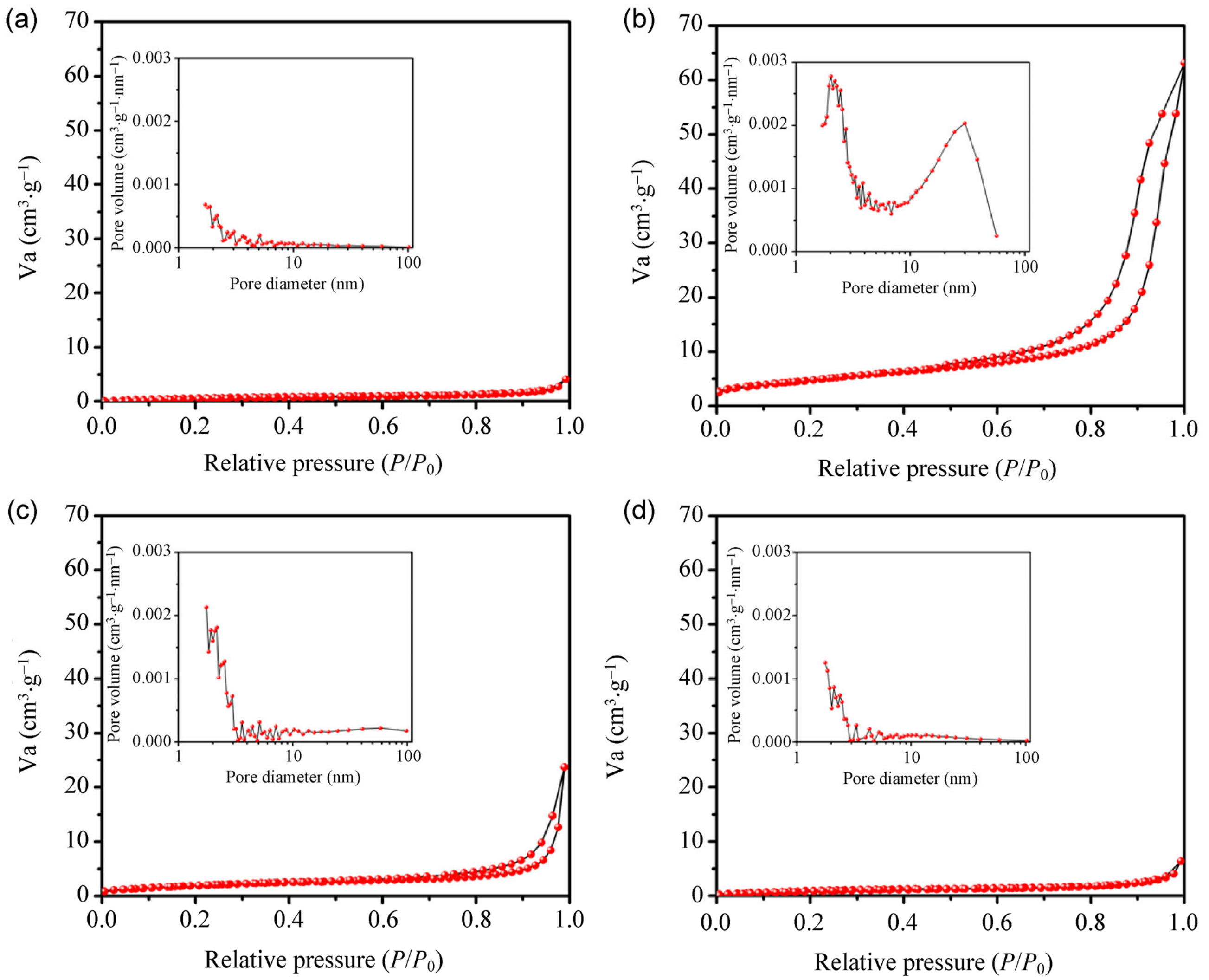

Figure S7 Nitrogen adsorption–desorption isotherms and corresponding pore size distribution (inset) of ammonium vanadium oxide octahedrons (a) and porous V_2O_5 octahedrons annealed at 350 °C (b), 500 °C (c) and 600 °C (d).

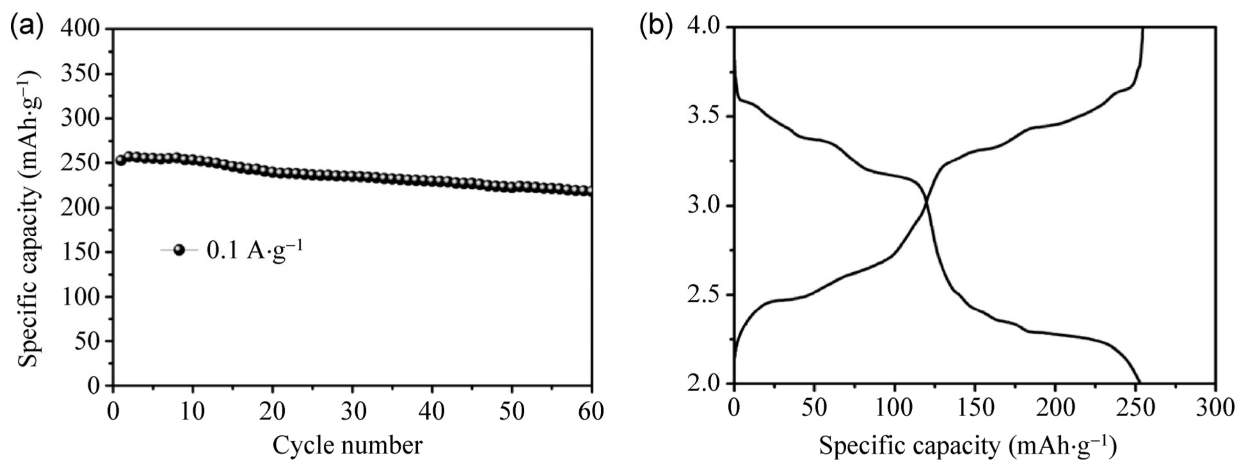

Figure S8 (a) Cycling performance and (b) discharge/charge curves of the first cycle of 3D porous V_2O_5 annealed at 350 °C at a current density of 100 mA·g^{-1} in the potential range from 2.0 to 4.0 V.

Table S1 The electrochemical performances (cycling performance at relevant current rate or density, and rate capability) of the 3D porous V_2O_5 octahedrons and the reported V_2O_5 materials

Sample	Voltage range (V)	Capacity ($mAh \cdot g^{-1}$)/ Cycle number	Current rate or density	Rate capacity ($mAh \cdot g^{-1}$) at relevant current rate or density
As-prepared 3D porous V_2O_5 octahedrons in this work	2.4–4	93/500	2 $A \cdot g^{-1}$	96 at 2 $A \cdot g^{-1}$
V_2O_5 microspheres[1]	2.5–4	~ 135/100	~ 0.3 $A \cdot g^{-1}$	92.2 at 2.25 $A \cdot g^{-1}$
3D porous V_2O_5 microspheres[2]	2.5–4	118/100	1.5 $A \cdot g^{-1}$	105 at 4.5 $A \cdot g^{-1}$
Porous V_2O_5 nanotubes[3]	2.5–4	105/250	2 $A \cdot g^{-1}$	62.5 at 15 $A \cdot g^{-1}$
3D porous V_2O_5[4]	2.5–4	110/200	1.5 $A \cdot g^{-1}$	86.7 at 8.4 $A \cdot g^{-1}$ (charged at 0.15 $A \cdot g^{-1}$)
hierarchical V_2O_5 hollow microspheres[5]	2.5–4	128/50	0.3 $A \cdot g^{-1}$	125 at 1.2 $A \cdot g^{-1}$

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