Supplementary Information

One-pot Hydrothermal Synthesis of Peony-like $Ag/Ag_{0.68}V_2O_5$ Hybrid as High-Performance Anode and Cathode Materials for Rechargeable Lithium Batteries

Denghu Wei, [a] Xiaona Li, [a] Yongchun Zhu,*[a] Jianwen Liang, [a] Kailong Zhang, [a] and Yitai Qian *[a,b]

[a] *Hefei National Laboratory for Physical Science at Microscale and Department of Chemistry, University of Science and Technology of China, Hefei, 230026, P.R. China. Tel: +86-551-63601589; E-mail: ychzhu@ustc.edu.cn*

[b] *School of Chemistry and Chemical Engineering, Shandong University, Jinan, 250100, PR China. Tel: +86-551-63607234; E-mail: ytqian@ustc.edu.cn*

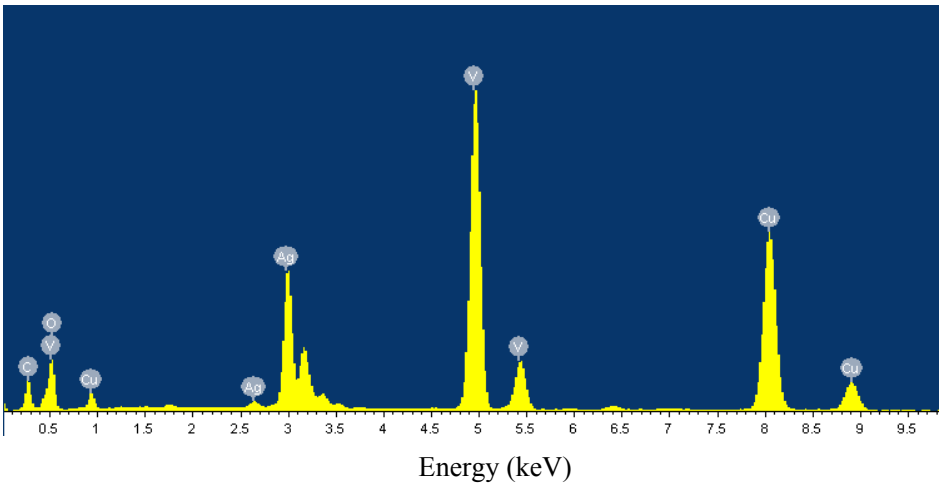

Figure S1. EDS of the $Ag/Ag_{0.68}V_2O_5$ hybrid.

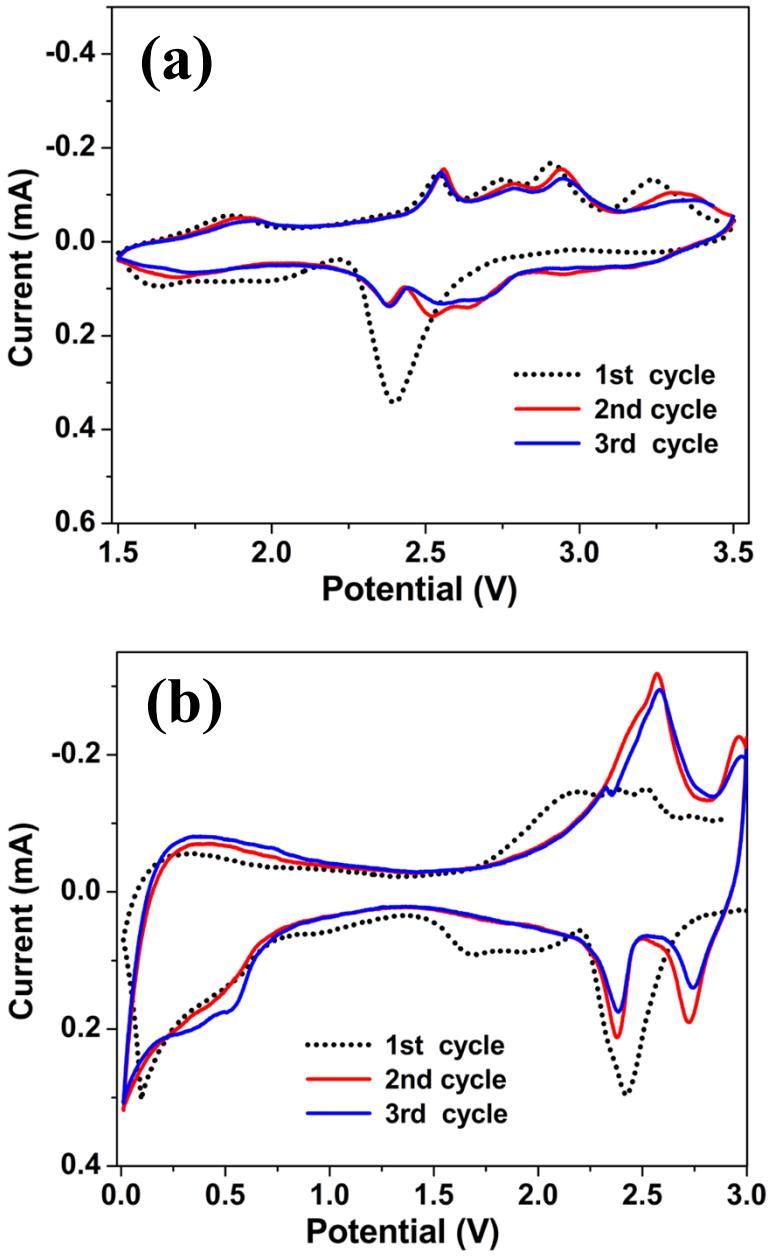

Figure S2 The first three consecutive CVs of the composite at a scan rate of 0.1 mV s^{-1} between 1.5 and 3.5 V (a); 0.01~3.00 V (b).

Method	Composition	Current density (mA/g)		Capacity (mAh/g) initial-last		Capacity retention (cycle number)	
		Cathode	Anode	Cathode	Anode	Cathode	Anode
Based on β-$AgVO_3$ [9]	β-$AgVO_3$/PANI	30		211-131		62%(20)	
Substrate-assisted [10]	β-$AgVO_3$ cluster	100		220-100		45%(50)	
Hydrothermal [S1]	β-$Ag_{0.33}V_2O_5$ nanowire	20		240-160		67% (8)	
Solid approach [17]	Ag/$AgVO_3$ nanorod	50		242-111		46%(30)	
This work	Ag/$Ag_{0.68}V_2O_5$ flower	100	400	321-150	499-524	47%(65)	105%(1000)

Table S1. Electrochemical properties of SVOs prepared by different methods.

[S1] Hu, W.; Zhang, X.; Cheng, Y.; Wu, C.; Cao, F.; Wang, L., *ChemSusChem* **2011**, *4*, 1091.

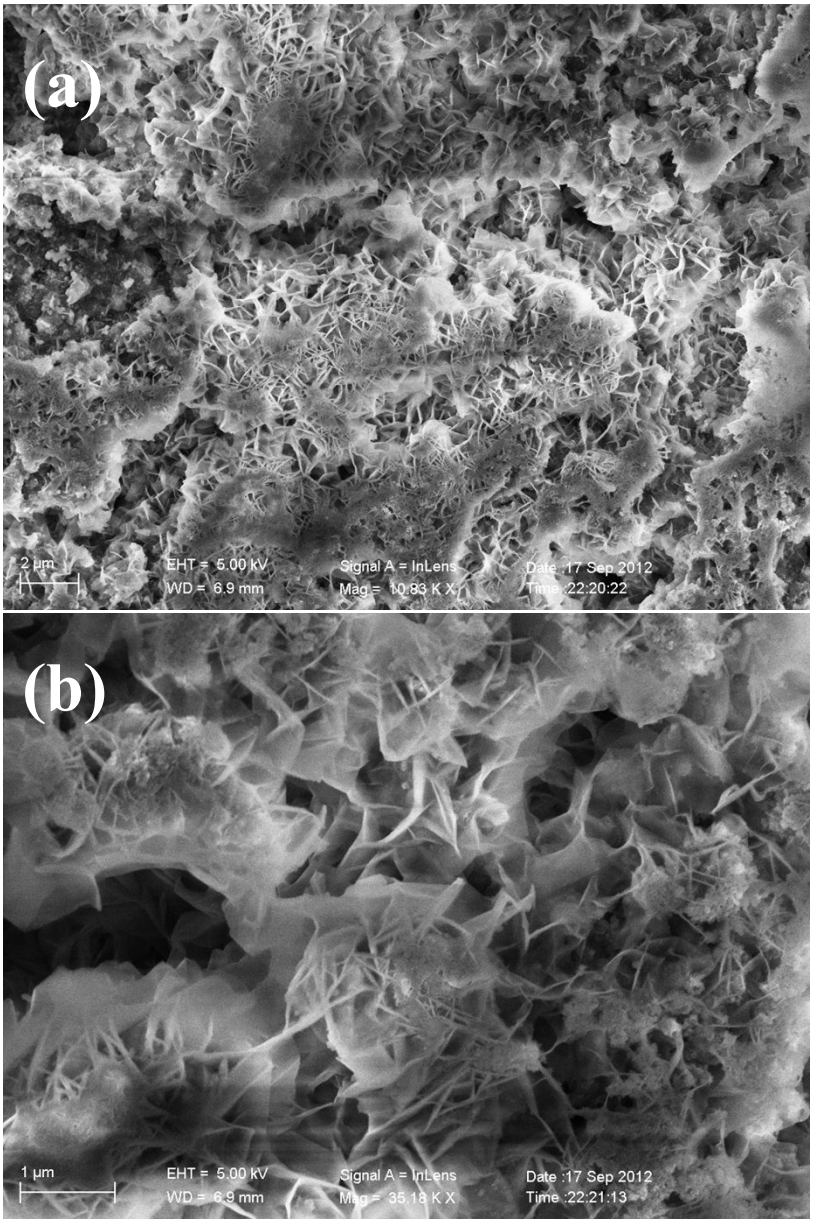

Figure S3 SEM images of the $Ag/Ag_{0.68}V_2O_5$ hybrid after a few cycles as a cathode material.

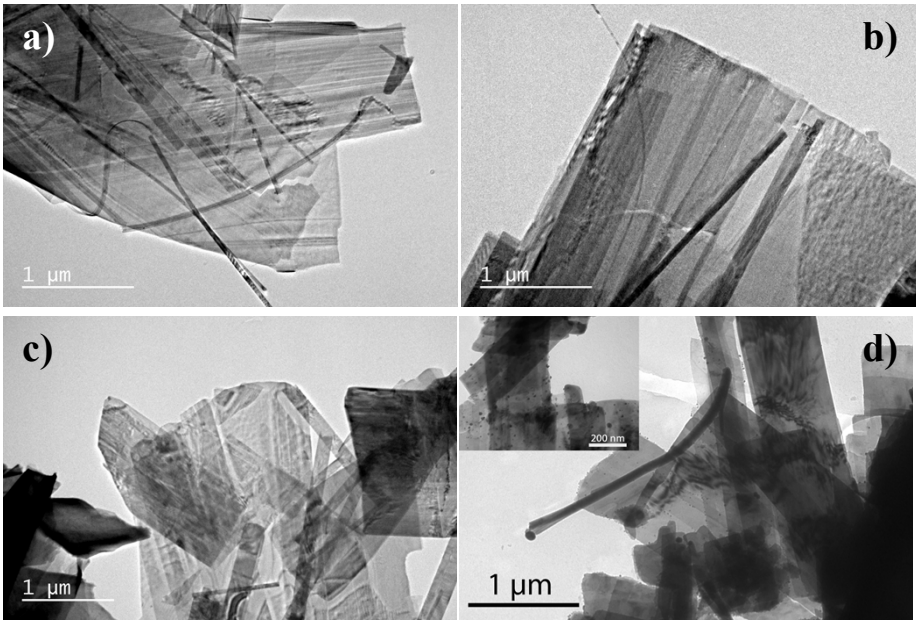

Figure S4 TEM images of the $Ag/Ag_{0.68}V_2O_5$ hybrid with different reaction time a) 1 h; b) 6 h; c) 12 h; and d) 24 h.

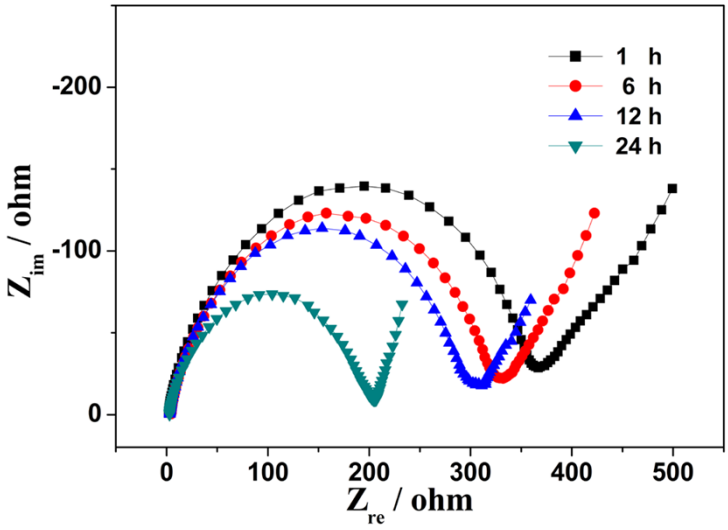

Figure S5 Electrochemical impedance spectrum of the samples with different reaction time.