Electronic Supplementary Information (ESI)

Rod-like anhydrous V_2O_5 assembled by tiny nanosheets as a high-performance cathode material for aqueous zinc-ion batteries

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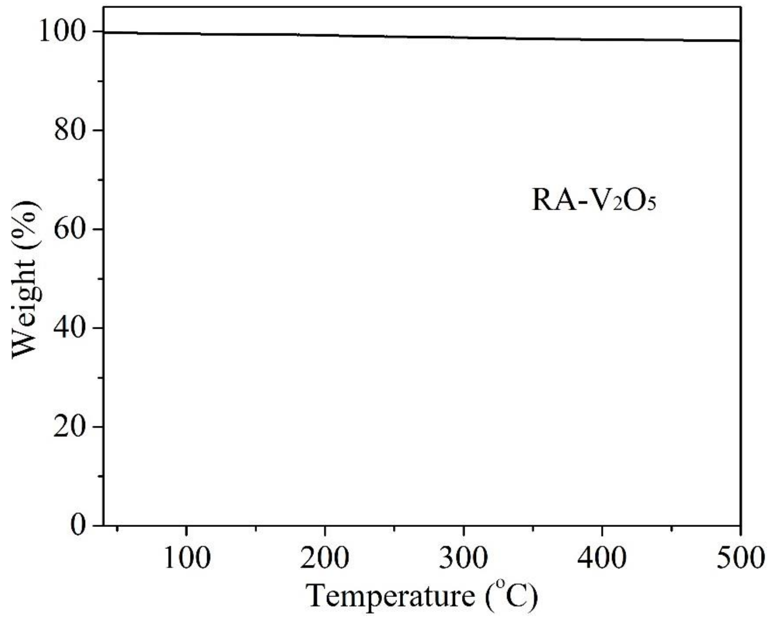

Fig. S1 TGA curve of RA-V_2O_5, measured in air at a heating rate of 10 ºC min^{-1}.

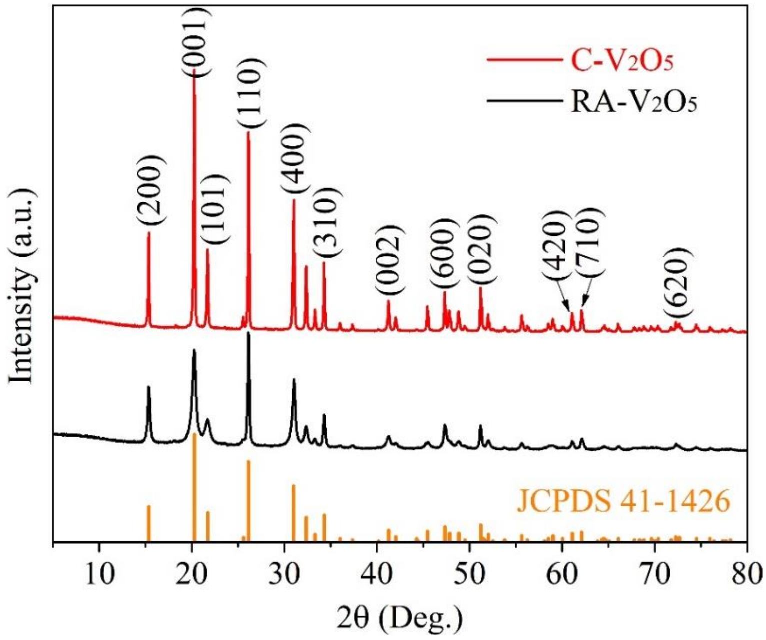

Fig. S2 XRD pattern of C-V_2O_5, in comparison with that of RA-V_2O_5.

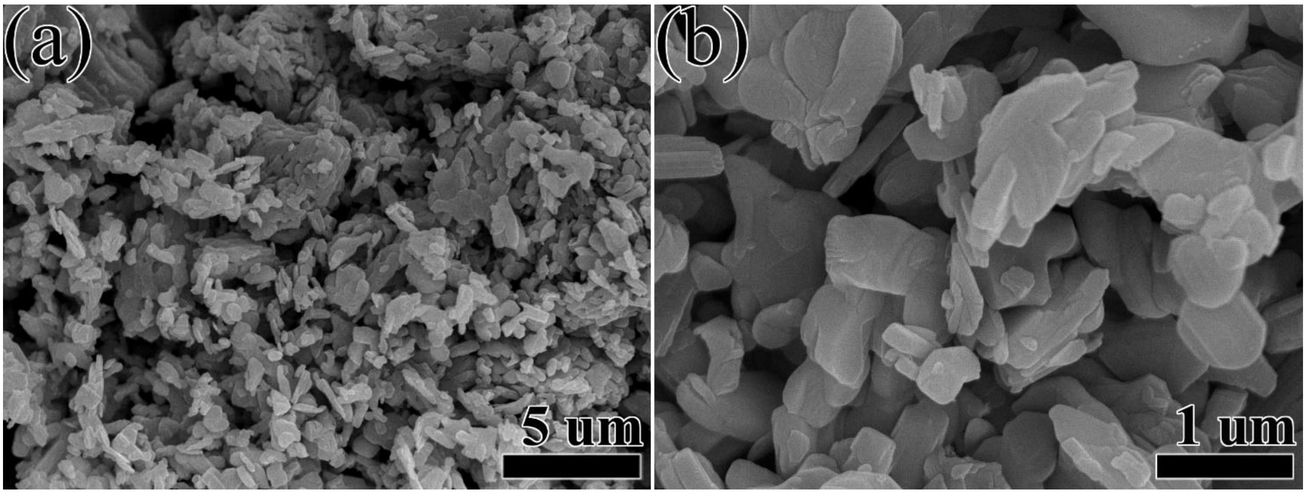

Fig. S3 (a, b) SEM images C-V_2O_5.

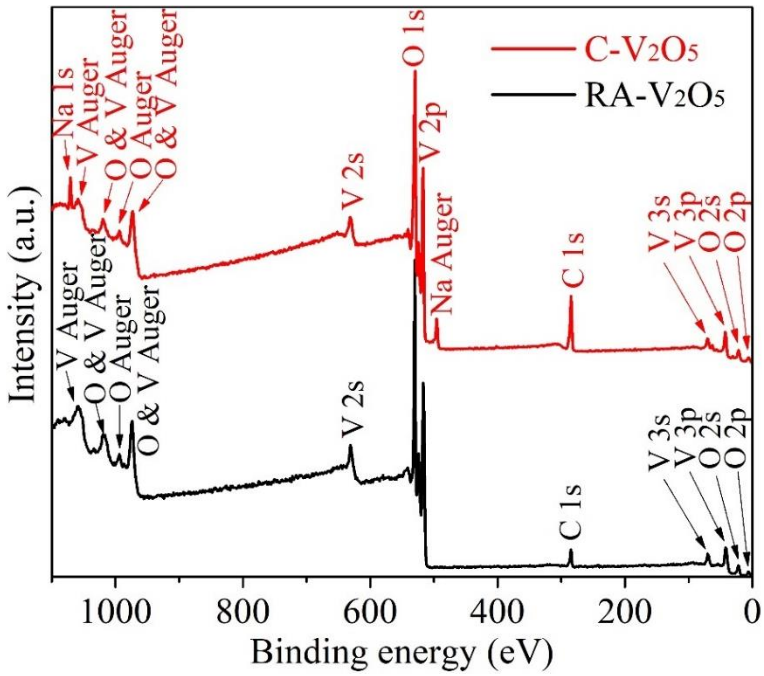

Fig. S4 XPS spectra of RA-V_2O_5 and C-V_2O_5.

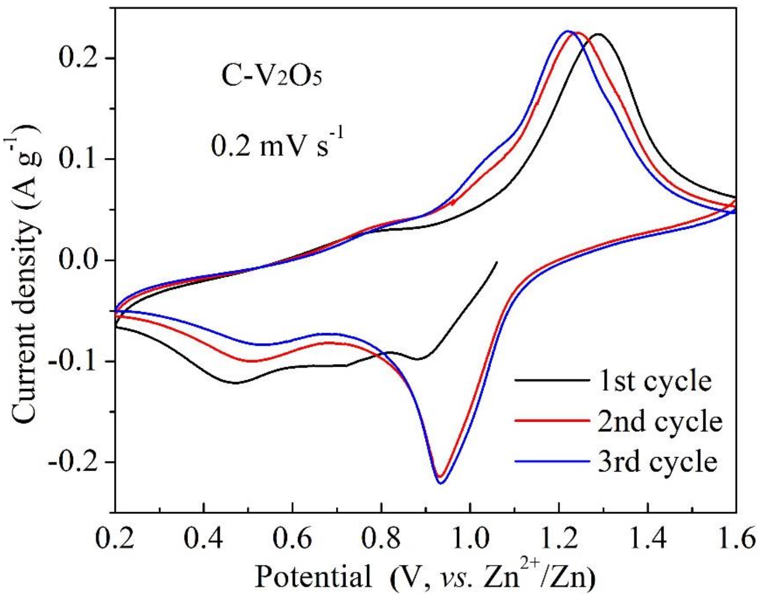

Fig. S5 CV curves of C-V_2O_5 in initial three cycles at 0.2 mV s^{-1}.

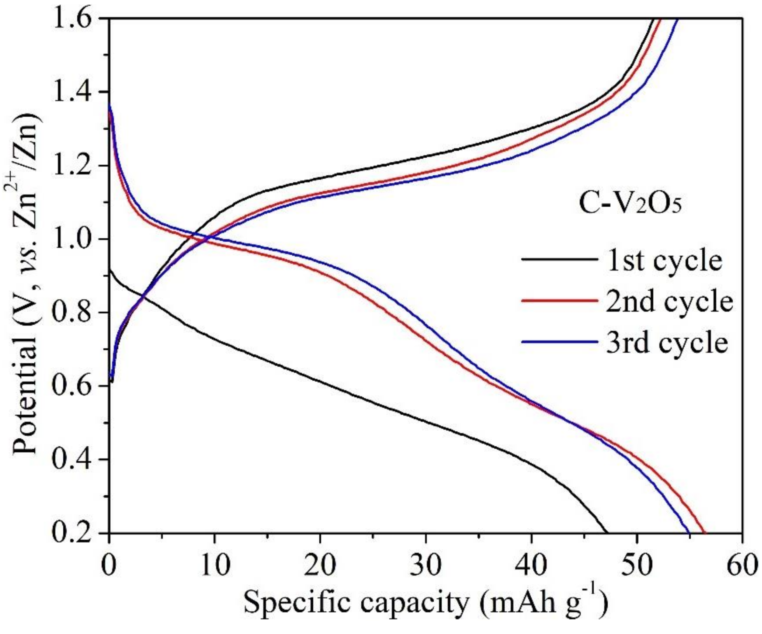

Fig. S6 GCD curves of C-V_2O_5 in initial three cycles at 0.1 A g^{-1}**.**

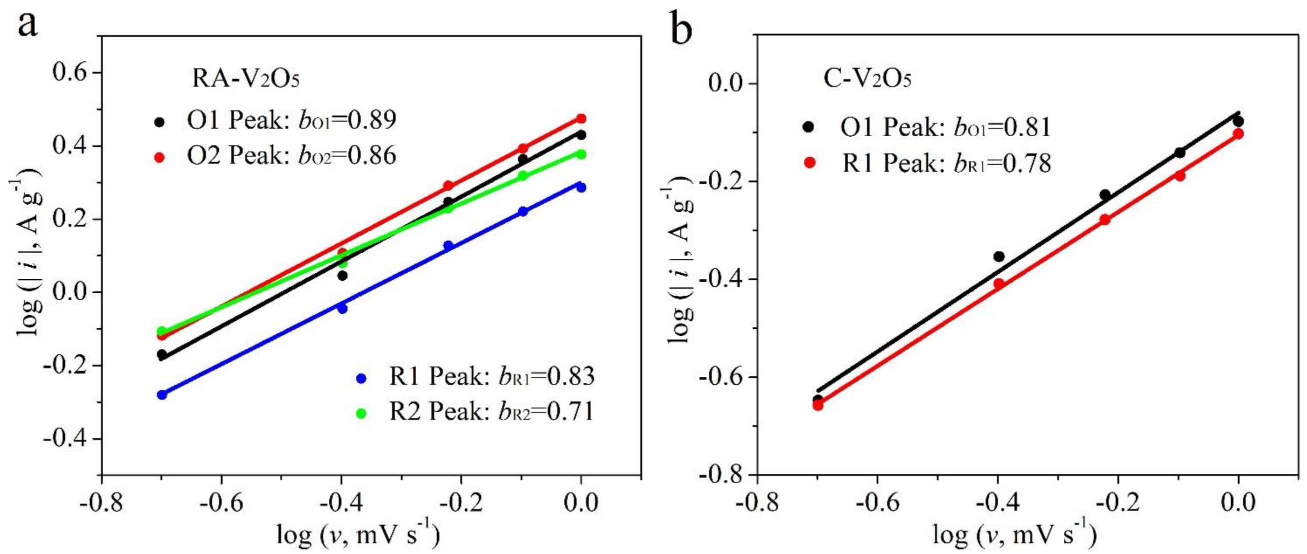

Fig. S7 Log (*i*) versus log (*v*) plots of different redox peaks of (a) RA-V_2O_5 and (b) C-V_2O_5 under CV measurements.

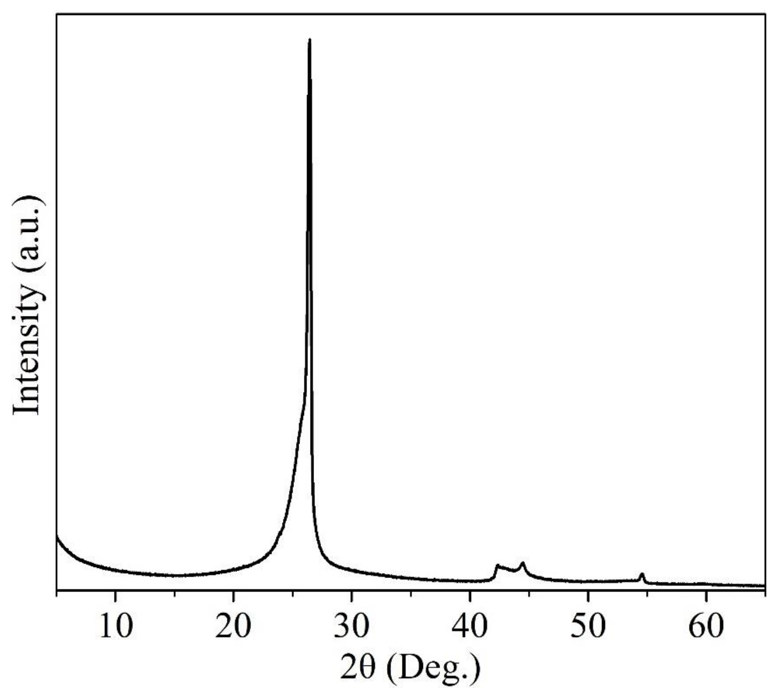

Fig. S8 XRD pattern of neat CNT power.

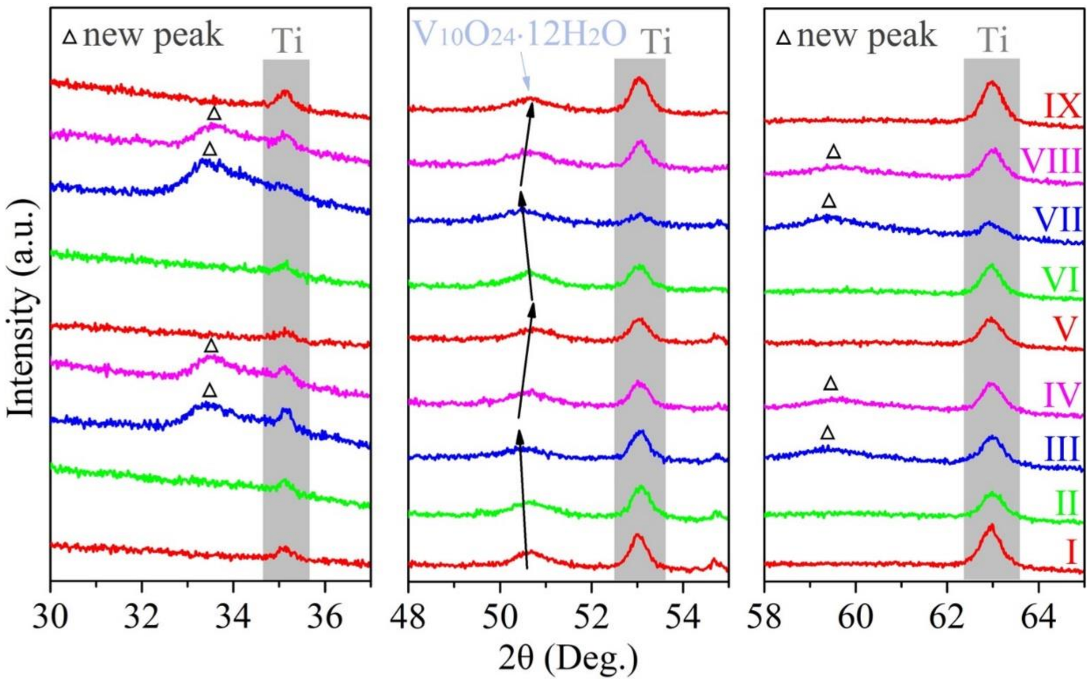

Fig. S9 The magnified ex situ XRD patterns of RA-V_2O_5 at nine different charge/discharge states at 21^{th} and 22^{th} cycles.

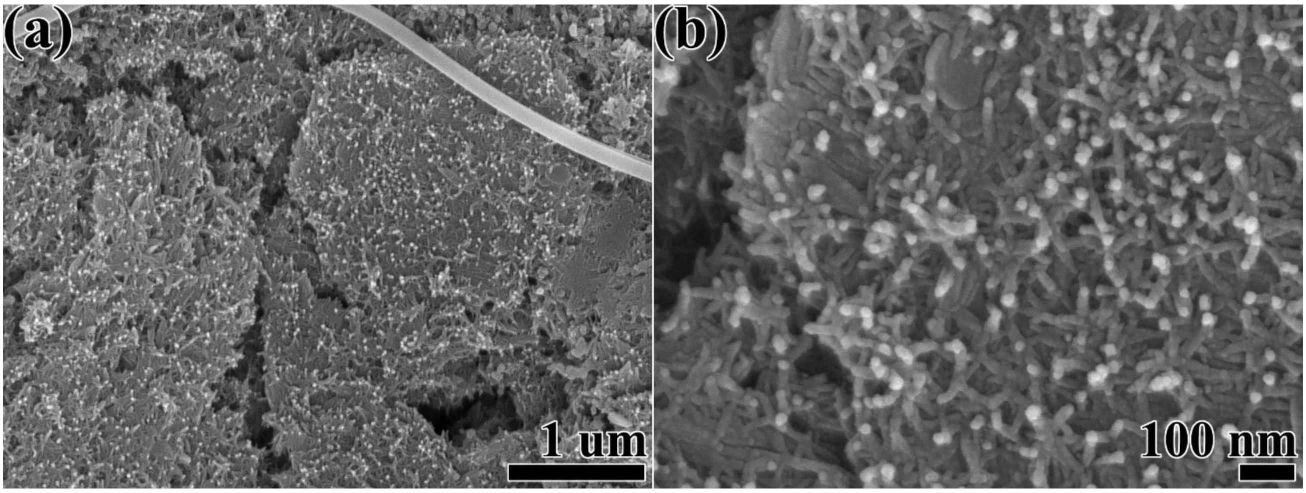

Fig. S10 SEM images of the RA-V_2O_5 electrode surface after 2000 cycles at 2 A g^{-1}.

Table S1 The capacities of RA-V_2O_5 in comparison with that of state-of-the-art vanadium-based cathode materials for AZIBs.

Cathode material	Capacity	Reference
RA-V_2O_5	449.8 mA h g^{-1} at 0.1 A g^{-1} 314.3 mA h g^{-1} at 2 A g^{-1} 186.8 mA h g^{-1} at 5 A g^{-1}	This report
$Mg_{0.34}V_2O_5\cdot0.84H_2O$	353 mA h g^{-1} at 0.1 A g^{-1} 81 mA h g^{-1} at 5 A g^{-1}	1
$Ag_{0.4}V_2O_5$	340 mA h g^{-1} at 0.1 A g^{-1} 185 mA h g^{-1} at 2 A g^{-1}	2
Porous V_2O_5 nanofibers	319 mA h g^{-1} at 0.02A g^{-1} 104 mA h g^{-1} at 3 A g^{-1}	3
V_2O_5 nanosheets	224 mA h g^{-1} at 0.1 A g^{-1} 100 mA h g^{-1} at 2 A g^{-1}	4
V_2O_5 nanospheres	188.7 mA h g^{-1} at 0.5 A g^{-1} 138.3 mA h g^{-1} at 5 A g^{-1}	5
V_2O_5 hollow spheres	280 mA h g^{-1} at 0.2 A g^{-1} 147 mA h g^{-1} at 5 A g^{-1}	6
VO_2	283 mA h g^{-1} at 0.1 A g^{-1} 72 mA h g^{-1} at 5 A g^{-1}	7
VO_2	274 mA h g^{-1} at 0.1 A g^{-1} 170 mA h g^{-1} at 5 A g^{-1}	8
$V_{10}O_{24}\cdot12H_2O$	164.5 mA h g^{-1} at 0.2 A g^{-1} 90.4 mA h g^{-1} at 5 A g^{-1}	9
VS_2	190.3 mA h g^{-1} at 0.05 A g^{-1} 115.5 mA h g^{-1} at 2 A g^{-1}	10
LiV_3O_8	230 mA h g^{-1} at 0.033 A g^{-1} 29 mA h g^{-1} at 1.666 A g^{-1}	11
$NaV_3O_8\cdot1.5H_2O$	375 mA h g^{-1} at 0.1 A g^{-1} 165 mA h g^{-1} at 4 A g^{-1}	12
NaV_6O_{15} nanorods	427 mA h g^{-1} at 0.05 A g^{-1} 195 mA h g^{-1} at 1.6 A g^{-1}	13
$Zn_2V_2O_7$	203.4 mA h g^{-1} at 0.3 A g^{-1} 155 mA h g^{-1} at 4 A g^{-1}	14
$Zn_2(OH)VO_4$	204 mA h g^{-1} at 0.1 A g^{-1} 160 mA h g^{-1} at 2 A g^{-1}	15
$Zn_3V_2O_7(OH)_2\cdot2H_2O$	213 mA h g^{-1} at 0.05 A g^{-1} 76 mA h g^{-1} at 3 A g^{-1}	16
$Fe_5V_{15}O_{39}(OH)_9\cdot9H_2O$	385 mA h g^{-1} at 0.1 A g^{-1} 105 mA h g^{-1} at 5 A g^{-1}	17
$VOPO_4$	139 mA h g^{-1} at 0.05 A g^{-1} 50 mA h g^{-1} at 5 A g^{-1}	18

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