Rod-like anhydrous V$_2$O$_5$ 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-V₂O₅, measured in air at a heating rate of 10 °C min⁻¹.

Fig. S2 XRD pattern of C-V₂O₅, in comparison with that of RA-V₂O₅.
Fig. S3 (a, b) SEM images C-V₂O₅.

Fig. S4 XPS spectra of RA-V₂O₅ and C-V₂O₅.
Fig. S5 CV curves of C-V$_2$O$_5$ in initial three cycles at 0.2 mV s$^{-1}$.

Fig. S6 GCD curves of C-V$_2$O$_5$ 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$_2$O$_5$ and (b) C-V$_2$O$_5$ under CV measurements.

**Fig. S8** XRD pattern of neat CNT power.
**Fig. S9** The magnified ex situ XRD patterns of RA-V$_2$O$_5$ at nine different charge/discharge states at 21$^{\text{th}}$ and 22$^{\text{th}}$ cycles.

**Fig. S10** SEM images of the RA-V$_2$O$_5$ electrode surface after 2000 cycles at 2 A g$^{-1}$. 
Table S1 The capacities of RA-V$_2$O$_5$ in comparison with that of state-of-the-art vanadium-based cathode materials for AZIBs.

| Cathode material                  | Capacity                                                                 | Reference |
|-----------------------------------|--------------------------------------------------------------------------|-----------|
| RA-V$_2$O$_5$                     | 449.8 mA h g$^{-1}$ at 0.1 A g$^{-1}$                                    | This report |
|                                   | 314.3 mA h g$^{-1}$ at 2 A g$^{-1}$                                      |           |
|                                   | 186.8 mA h g$^{-1}$ at 5 A g$^{-1}$                                      |           |
| Mg$_{0.34}$V$_2$O$_5$·0.84H$_2$O  | 353 mA h g$^{-1}$ at 0.1 A g$^{-1}$                                      | 1         |
|                                   | 81 mA h g$^{-1}$ at 5 A g$^{-1}$                                         |           |
| Ag$_{0.4}$V$_2$O$_5$              | 340 mA h g$^{-1}$ at 0.1 A g$^{-1}$                                      | 2         |
|                                   | 185 mA h g$^{-1}$ at 2 A g$^{-1}$                                         |           |
| Porous V$_2$O$_5$ nanofibers      | 319 mA h g$^{-1}$ at 0.02A g$^{-1}$                                      | 3         |
|                                   | 104 mA h g$^{-1}$ at 3 A g$^{-1}$                                         |           |
| V$_2$O$_5$ nanosheets             | 224 mA h g$^{-1}$ at 0.1 A g$^{-1}$                                      | 4         |
|                                   | 100 mA h g$^{-1}$ at 2 A g$^{-1}$                                         |           |
| V$_2$O$_5$ hollow spheres         | 188.7 mA h g$^{-1}$ at 0.5 A g$^{-1}$                                    | 5         |
|                                   | 138.3 mA h g$^{-1}$ at 5 A g$^{-1}$                                      |           |
| VO$_2$                            | 280 mA h g$^{-1}$ at 0.2 A g$^{-1}$                                      | 6         |
|                                   | 147 mA h g$^{-1}$ at 5 A g$^{-1}$                                         |           |
| VO$_2$                            | 283 mA h g$^{-1}$ at 0.1 A g$^{-1}$                                      | 7         |
|                                   | 72 mA h g$^{-1}$ at 5 A g$^{-1}$                                          |           |
| V$_{10}$O$_{24}$·12H$_2$O         | 164.5 mA h g$^{-1}$ at 0.2 A g$^{-1}$                                    | 8         |
|                                   | 90.4 mA h g$^{-1}$ at 5 A g$^{-1}$                                        |           |
| VS$_2$                            | 190.3 mA h g$^{-1}$ at 0.05 A g$^{-1}$                                   | 9         |
|                                   | 115.5 mA h g$^{-1}$ at 2 A g$^{-1}$                                      |           |
| LiV$_3$O$_6$                      | 230 mA h g$^{-1}$ at 0.033 A g$^{-1}$                                    | 10        |
|                                   | 29 mA h g$^{-1}$ at 1.666 A g$^{-1}$                                     |           |
| NaV$_3$O$_8$·1.5H$_2$O            | 375 mA h g$^{-1}$ at 0.1 A g$^{-1}$                                      | 11        |
|                                   | 165 mA h g$^{-1}$ at 4 A g$^{-1}$                                         |           |
| NaV$_3$O$_{15}$ nanorods          | 427 mA h g$^{-1}$ at 0.05 A g$^{-1}$                                     | 12        |
|                                   | 195 mA h g$^{-1}$ at 1.6 A g$^{-1}$                                      |           |
| Zn$_2$V$_2$O$_7$                  | 203.4 mA h g$^{-1}$ at 0.3 A g$^{-1}$                                    | 13        |
|                                   | 155 mA h g$^{-1}$ at 4 A g$^{-1}$                                         |           |
| Zn$_2$(OH)$_2$VO$_4$              | 204 mA h g$^{-1}$ at 0.1 A g$^{-1}$                                      | 14        |
|                                   | 160 mA h g$^{-1}$ at 2 A g$^{-1}$                                         |           |
| Zn$_3$V$_2$O$_7$(OH)$_2$·2H$_2$O   | 213 mA h g$^{-1}$ at 0.05 A g$^{-1}$                                     | 15        |
|                                   | 76 mA h g$^{-1}$ at 3 A g$^{-1}$                                          |           |
| Fe$_5$V$_{15}$O$_{30}$(OH)$_9$·9H$_2$O | 385 mA h g$^{-1}$ at 0.1 A g$^{-1}$                                     | 16        |
|                                   | 105 mA h g$^{-1}$ at 5 A g$^{-1}$                                         |           |
| VOPO$_4$                          | 139 mA h g$^{-1}$ at 0.05 A g$^{-1}$                                     | 17        |
|                                   | 50 mA h g$^{-1}$ at 5 A g$^{-1}$                                          |           |
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