Electronic Supplementary Material (ESI) for Materials Advances.

Supplementary Materials

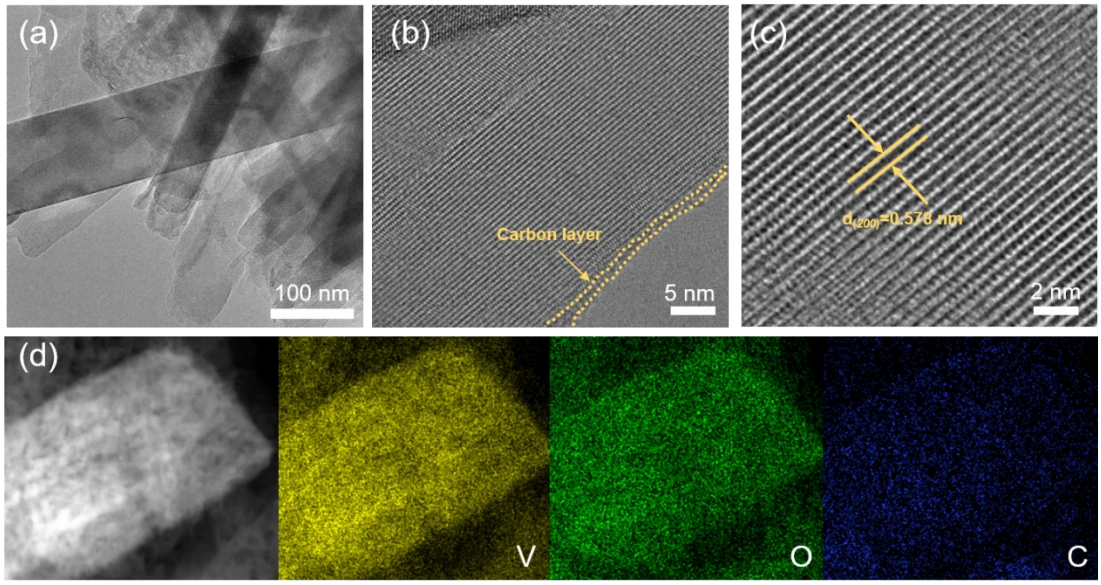

Fig. S1. (a) TEM image, (b, c) HRTEM images, and (d) EDS elemental mapping images of VO_2@C-300.

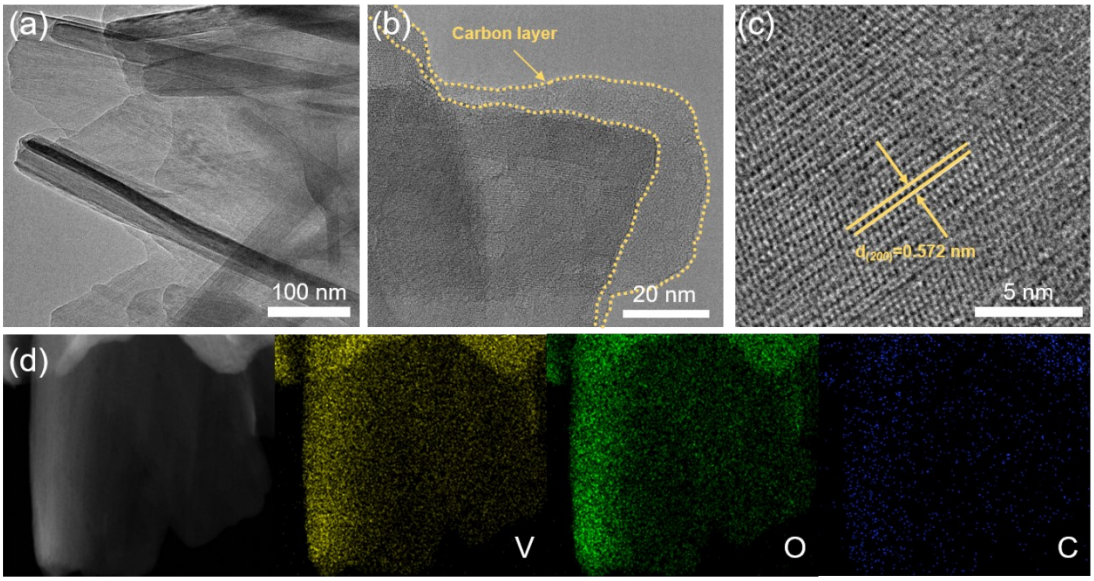

Fig. S2. (a, b) TEM images, (c) HRTEM image, and (d) EDS elemental mapping images of VO_2@C-400.

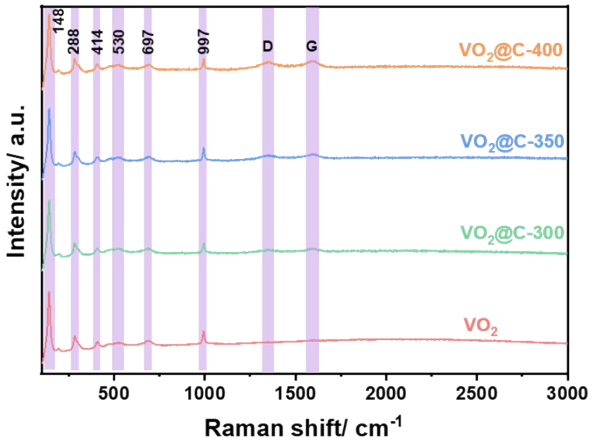

Fig. S3. Raman spectra of VO_2, VO_2@C-300, VO_2@C-350, and VO_2@C-400.

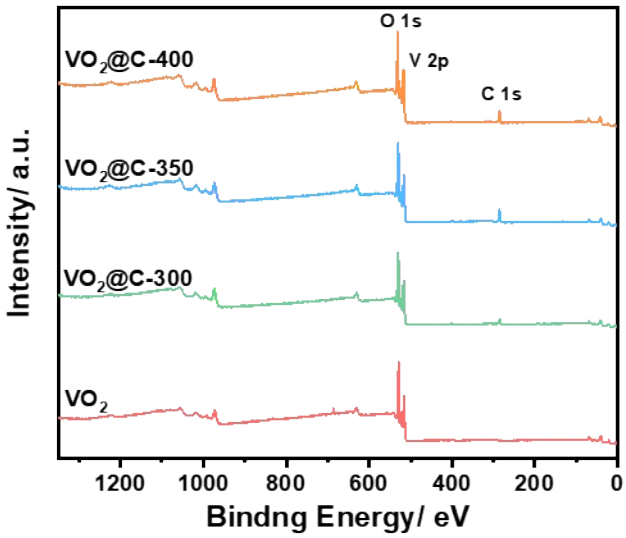

Fig. S4. Survey XPS spectra of VO_2, VO_2@C-300, VO_2@C-350, and VO_2@C-400.

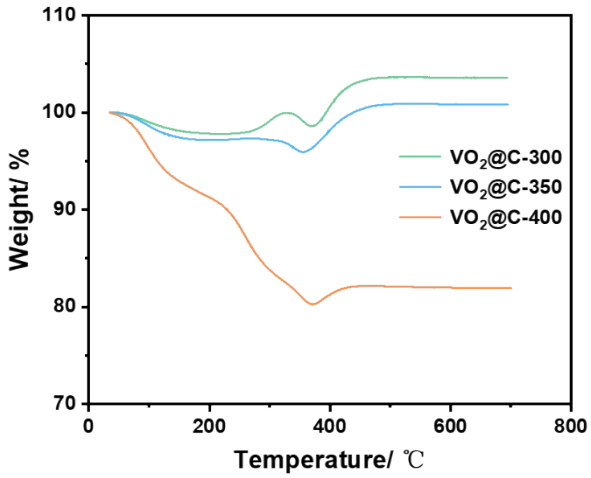

Fig. S5. TGA curves of VO_2@C-300, VO_2@C-350, and VO_2@C-400 in the air.

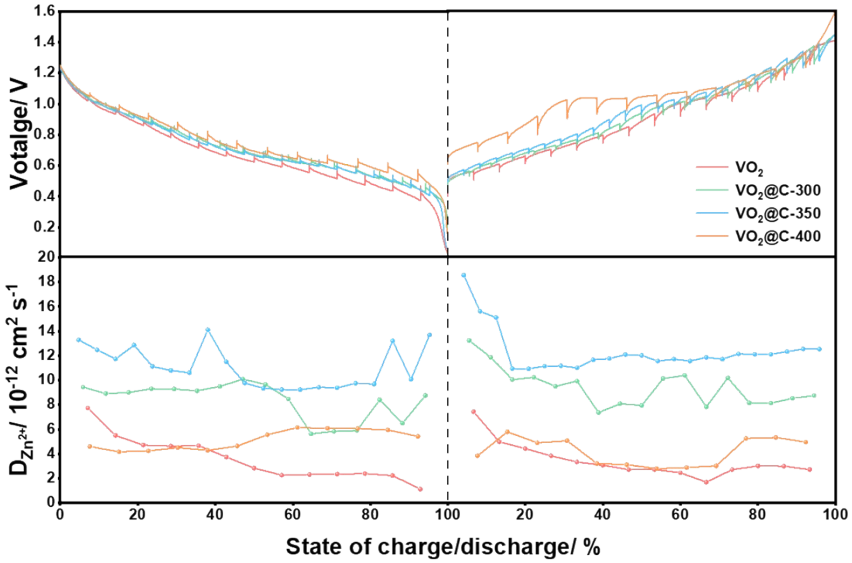

Fig. S6. (a) GITT curves for VO_2, VO_2@C-300, VO_2@C-350, and VO_2@C-400. (b, c) Zn^{2+} diffusion coefficient curves with the corresponding discharge/charge states of VO_2, VO_2@C-300, VO_2@C-350, and VO_2@C-400.

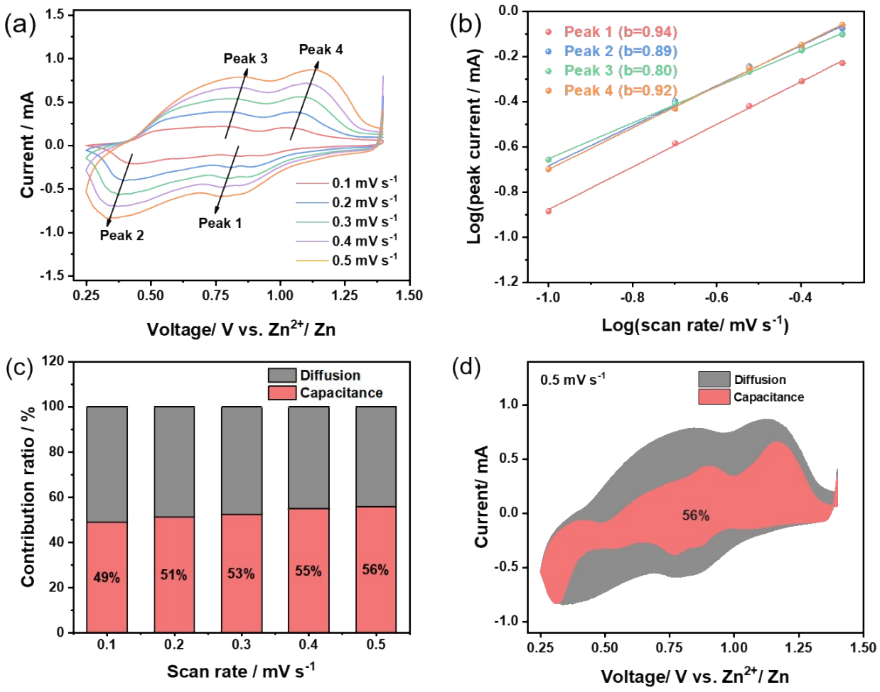

Fig. S7. Electrochemical kinetics investigation of pure VO_2. (a) CV curves at various scan rates from 0.1 to 0.5 mV s^{-1}. (b) Log(*i*) versus log(*v*) plots and *b* values for the slopes. (c) Capacitive contribution at various scan rates. (d) Capacitive contribution at 0.5 mV s^{-1}.

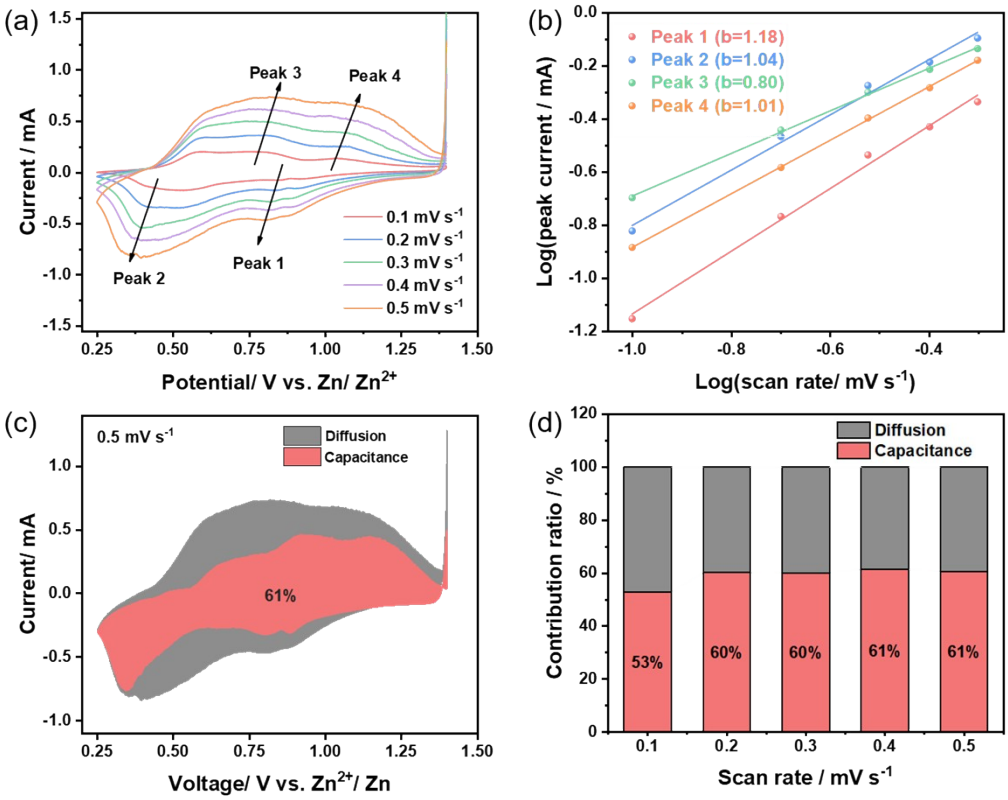

Fig. S8. Electrochemical kinetics investigation of VO_2@C-300. (a) CV curves for VO_2@C-300 at 0.1-0.5 mV s^{-1}. (b) Log(*i*) versus log(*v*) plots of VO_2@C-300. (c) Contribution of capacitive ion storage of VO_2@C-300 at 0.1-0.5 mV s^{-1}. (d) Contribution of capacitive ion storage of VO_2@C-300 at 0.5 mV s^{-1}.

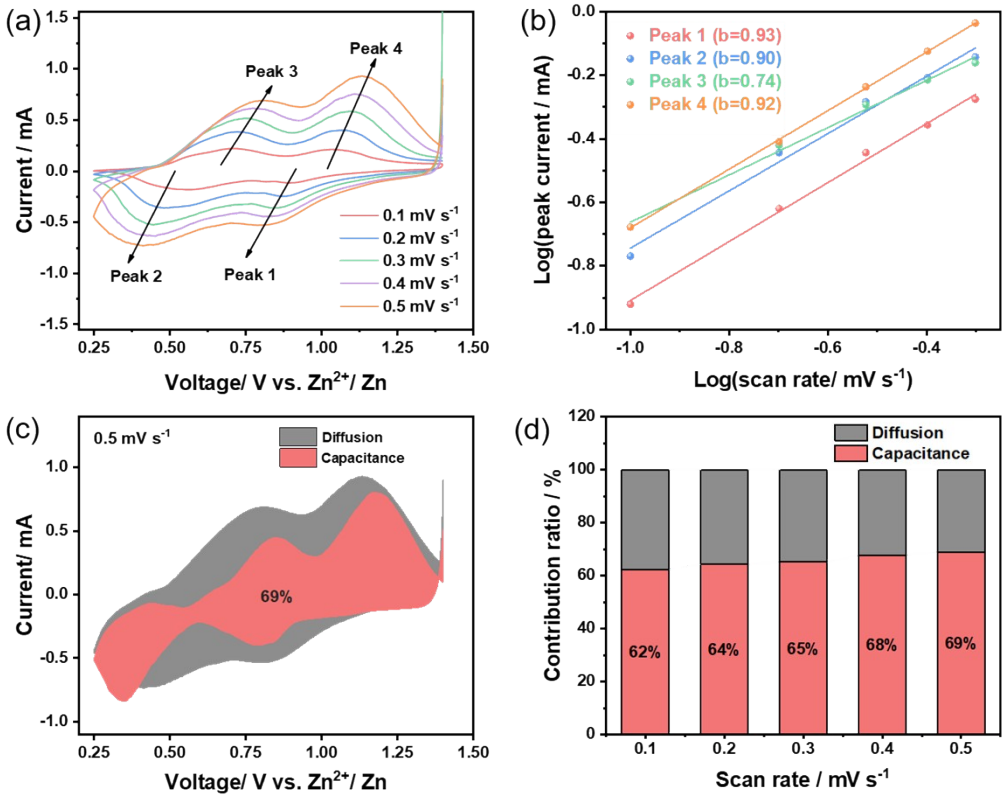

Fig. S9. Electrochemical kinetics investigation of VO_2@C-400. (a) CV curves for VO_2@C-400 at 0.1-0.5 mV s^{-1}. (b) Log(*i*) versus log(*v*) plots of VO_2@C-400. (c) Contribution of capacitive ion storage of VO_2@C-400 at 0.1-0.5 mV s^{-1}. (d) Contribution of capacitive ion storage of VO_2@C-400 at 0.5 mV s^{-1}.

Table S1. Fitting results of the EIS spectra for the AZIBs in Fig. 4a.

Electrode	R_s/ Ω	R_{ct}/ Ω	σ/ Ω $s^{-1/2}$	D_{Zn}^{2+}/ cm^2 s^{-1}
VO_2	15.0	119.1	31.8	9.7×10^{-11}
VO_2@C-300	13.2	100.4	24.0	1.7×10^{-10}
VO_2@C-350	4.2	92.2	6.0	2.7×10^{-9}
VO_2@C-400	17.4	127.3	27.3	1.3×10^{-10}