Supporting Information for

Vanadium Pentoxide Cathode Materials for High-performance Lithium-ion Batteries Enabled by Hierarchical Nanoflower Structure via An Electrochemical Process

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**Figure S1.** Schematic representation of a reaction process by electrochemical reaction of a starting vanadium foil.
Figure S2

Figure S2. The (a-b) FESEM images of the as-prepared $V_{10}O_{24}\cdot nH_2O$ nanoflowers; (c-d) The FESEM images of the $V_2O_5$ nanoflowers after thermal annealing.
**Figure S3.** The (a, b) TEM images of the as-prepared V$_{10}$O$_{24}$·nH$_2$O nanoflowers. The (c, d) TEM images of V$_2$O$_5$ nanoflowers after thermal annealing. The insets in (d) is high-magnification TEM image of a nanosheet of V$_2$O$_5$ nanoflowers; (e) Low- and (f) high-resolution TEM images of nanoribbons for the V$_2$O$_5$ samples for determining the growth direction.
Figure S4

Figure S4. The colors of the reacted solution are shown at different time intervals.
Figure S5. FESEM images shown in (a), (b), (c) are for powder samples taken at points marked P1, P2, and P3 respectively in Figure 3a. Images (d), (e), (f) are from the samples that undergo different aging time of 12, 24 and 36 h respectively.
Figure S6

**Figure S6.** The vanadium foil obtained after drying in air. The foil was taken after electrochemical oxidation in NaCl aqueous solution for around 300 s.
Figure S7. Nitrogen adsorption–desorption isotherms of the V$_2$O$_5$ samples. The pore size distribution (BJH desorption) is shown in the inset. The surface area is 22.7 m$^2$/g with an average pore size around 20.8 nm and a pore volume around 0.12 cm$^3$/g.
**Figure S8.** XRD pattern (a) and FESEM image (b) of spherical $\text{V}_2\text{O}_5$ prepared by a polyvinyl pyrrolidone (PVP)-assisted hydrolysis method.