Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A

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

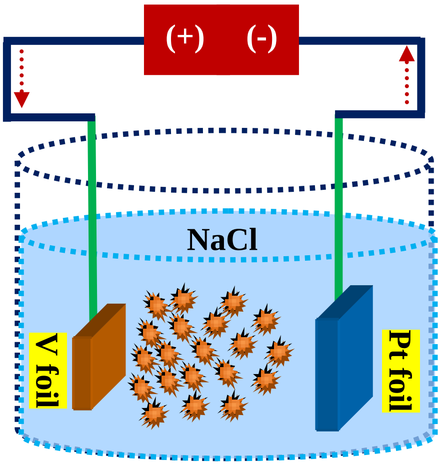

Figure S1. Schematic representation of a reaction process by electrochemical reaction of a starting vanadium foil.

Figure S2

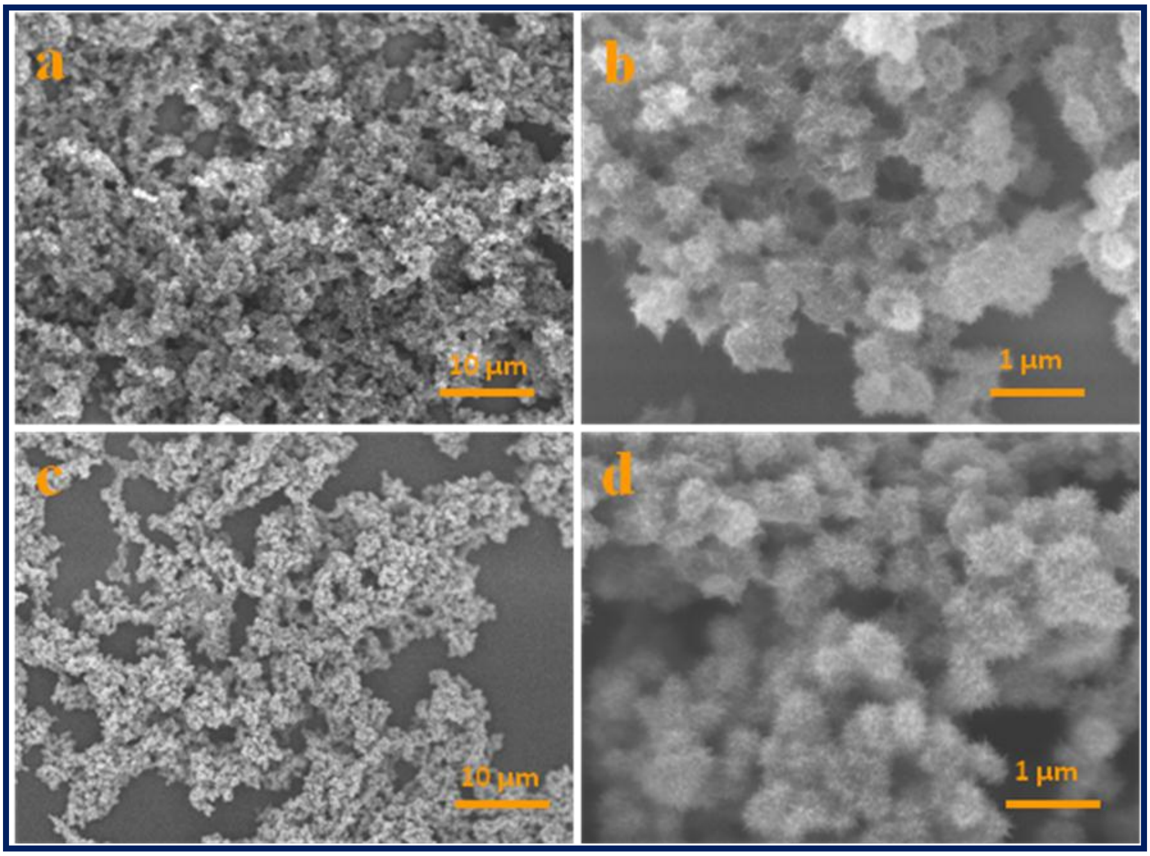

Figure S2. The (a-b) FESEM images of the as-prepared $V_{10}O_{24}{\cdot}nH_2O$ nanoflowers; (c-d) The FESEM images of the V_2O_5 nanoflowers after thermal annealing.

Figure S3

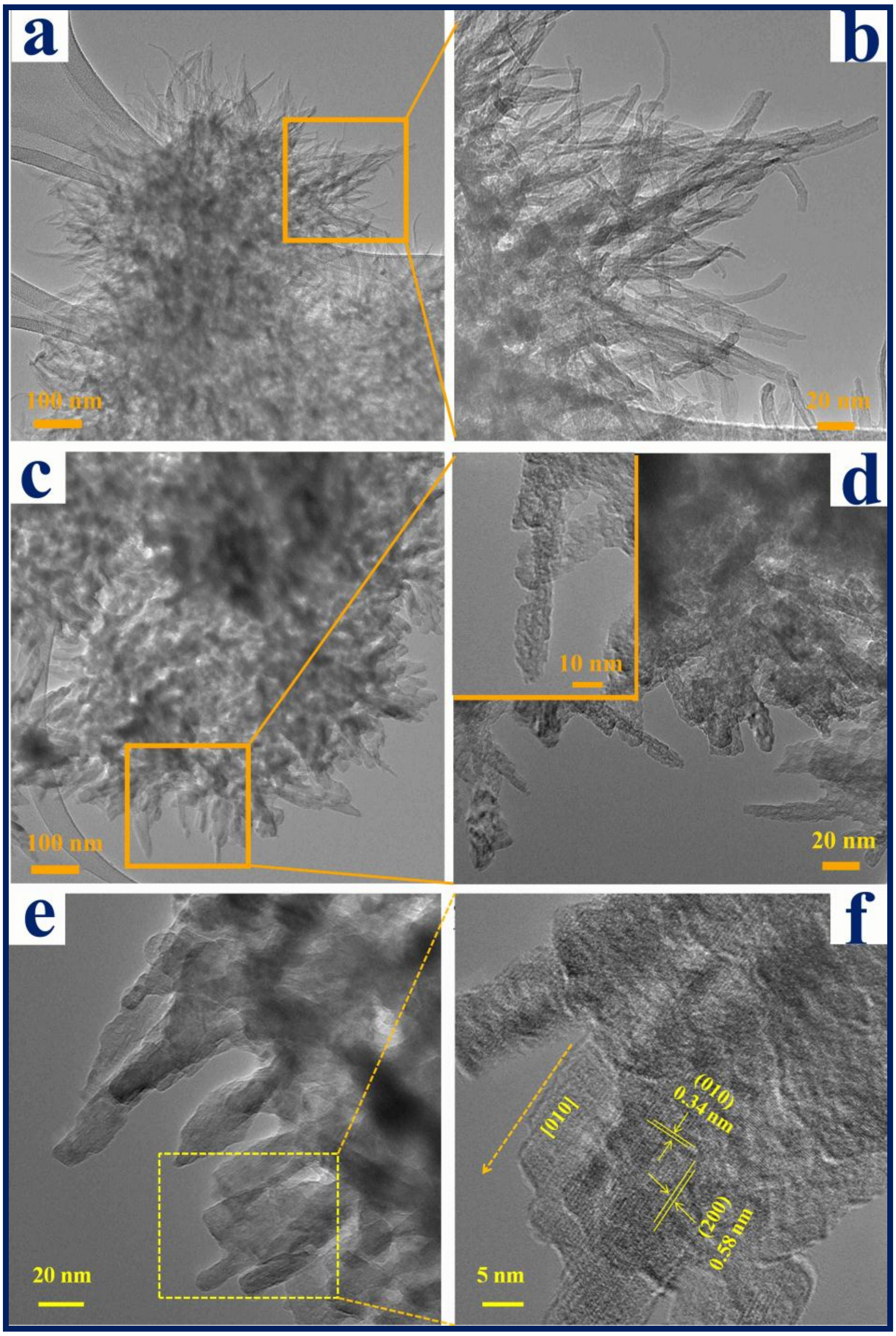

Figure S3. The (a, b) TEM images of the as-prepared $V_{10}O_{24}\cdot nH_2O$ nanoflowers. The (c, d) TEM images of V_2O_5 nanoflowers after thermal annealing. The insets in (d) is high-magnification TEM image of a nanosheet of V_2O_5 nanoflowers; (e) Low- and (f) high-resolution TEM images of nanoribbons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

Figure S4

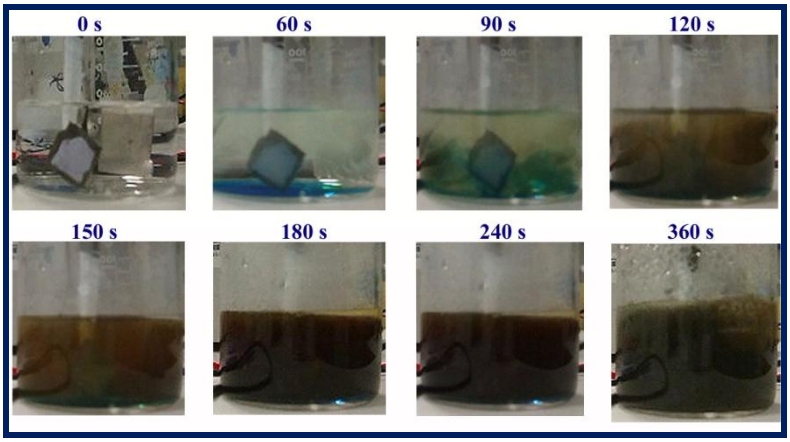

Figure S4. The colors of the reacted solution are shown at different time intervals.

Figure S5

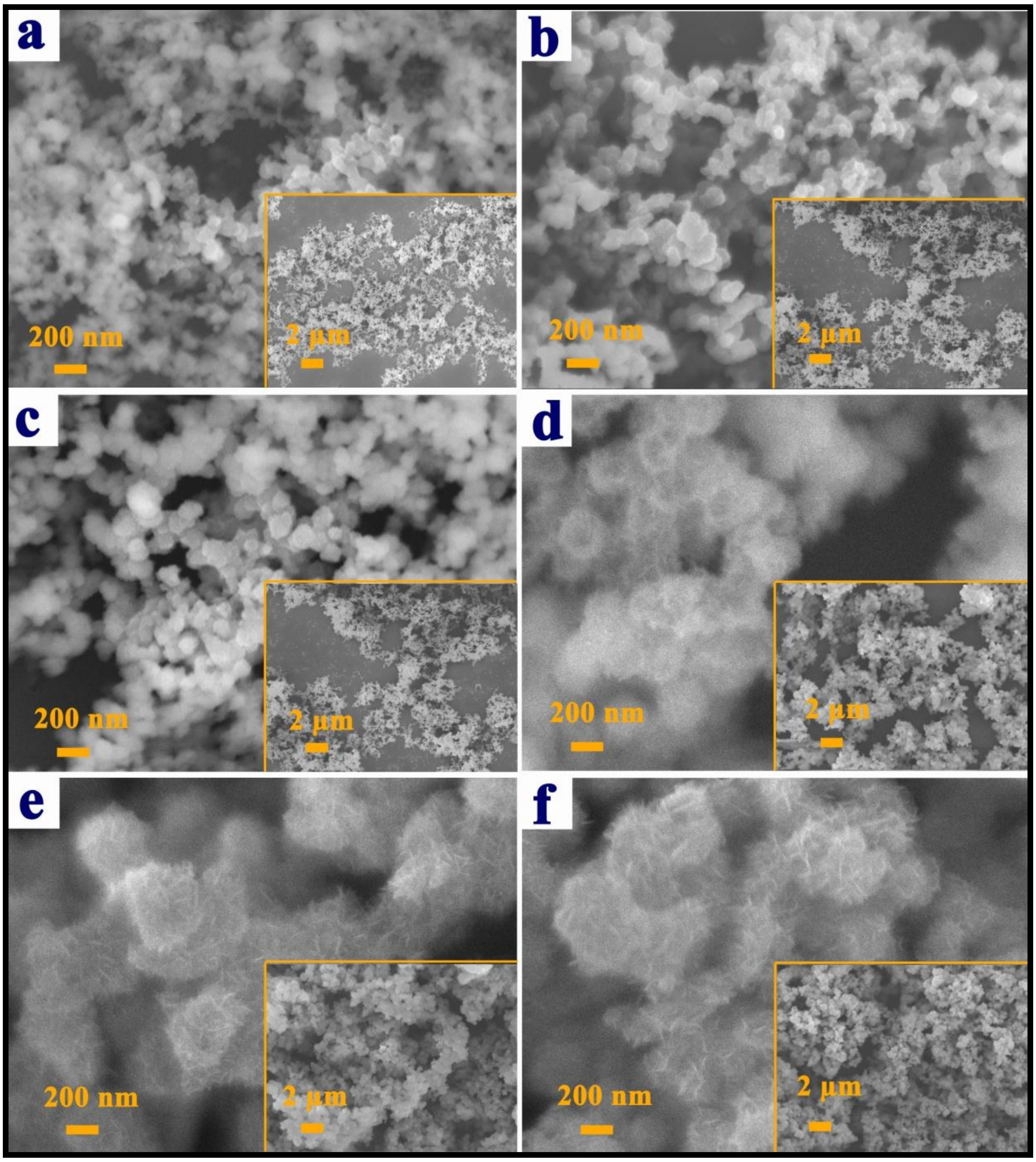

Figure S5. FESEM images shown in (a), (b), (c) are for powder samples taken at points marked P1, P2, and P3 respectively in Figure 3a. Images (d), (e), (f) are from the samples that undergo different aging time of 12, 24 and 36 h respectively.

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

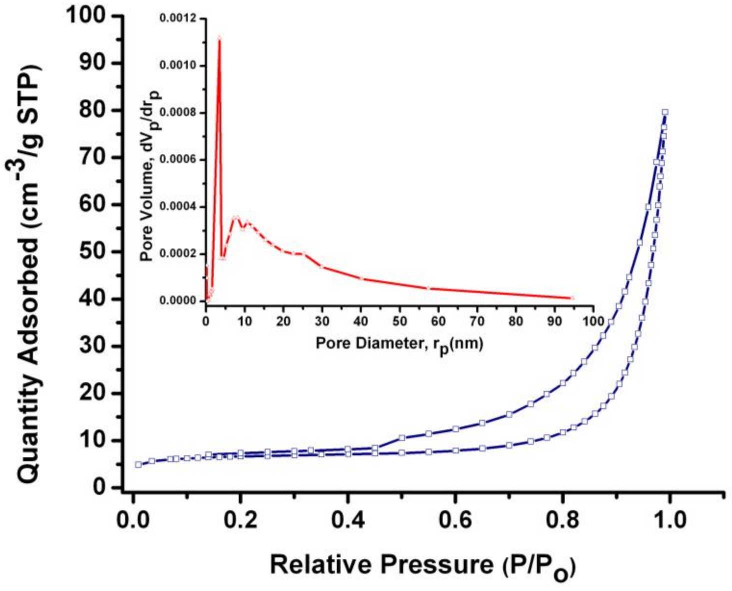

Figure S7. Nitrogen adsorption−desorption isotherms of the V_2O_5 samples. The pore size distribution (BJH desorption) is shown in the inset. The surface area is 22.7 m^2/g with a average pore size around 20.8 nm and a pore volume aorund 0.12 cm^3/g.

Figure S8

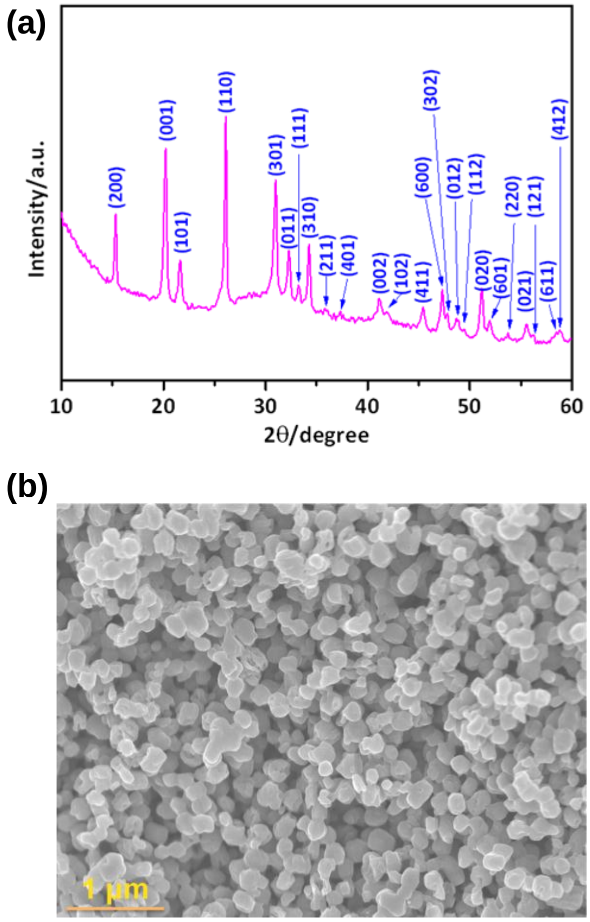

Figure S8. XRD pattern (a) and FESEM image (b) of spherical V_2O_5 prepared by a polyvinyl pyrrolidone (PVP)-assisted hydrolysis method.