Supporting information

Porous MoO_2 Nanowires as Stable and High-Rate Negative Electrode for Electrochemical Capacitors

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Experimental Section

***Preparation of MoO_3 and MoO_2 nanowires*:** MoO_3 nanowires were grown on a carbon cloth substrate by a seed-assisted hydrothermal approach. Firstly, $Na_2MoO_4 \cdot 2H_2O$ (2.5 g) was dissolved in the solution containing HCl (5 mL, 37 wt %) and DI water (20 mL). And then, the carbon cloth (70 mg), which were moistened in advanced, were immerged into the above solution for 5 min and blow-dried with the help of air blower. Immediately, the dry carbon cloth was further heated in the oven with the constant temperature of 300 ^oC for another 5 min, which formed MoO_3 nanoparticles on it. $(NH_4)_6Mo_7O_{24}$ (0.5 g), was dissolved in the mixture of concentrated HNO_3 (3 mL, 65 wt %) and DI water (17 mL) to form the precursor solution. Subsequently, the prepared carbon cloth were immerged into the resultant precursor solution, and transferred to a Teflon-lined stainless steel autoclave (25 mL volume). The autoclave was heated in a drying oven with a heating speed of 10 ^oC min-1 to 180 ^oC, kept for 10 min and then allowed to cooled down to ambient temperature. Afterward, the carbon cloth were thoroughly washed with DI water and dried, which formed the sample of MoO_3 nanowires. Finally, to obtain the MoO_2 nanowires, the as-prepared MoO_3 nanowires were annealed at 400 ^oC in H_2 for 1 h.

Characterization: The morphology and structure of the samples were characterized by field-

emission scanning electron microscopy (FE-SEM, JSM-6330F), Transmission electron microscopy (TEM, JEM2010-HR, 200 KV), XPS (XPS, ESCALab250, Thermo VG), X-ray diffraction (XRD, Bruker, D8 ADVANCE) with Cu K*a* radiation, and Raman spectroscopy (Renishaw inVia). The cyclic voltammetry (CV) and galvanostatic charge/discharge and electrochemical impedance spectroscopy (EIS) measurements were conducted using an electrochemical workstation (CHI 660D). The electrochemical studies of the individual electrode were performed in a three-electrode cell, with a Pt counter electrode and a Ag/AgCl reference electrode. The electrolyte is 5 M LiCl aqueous solution.

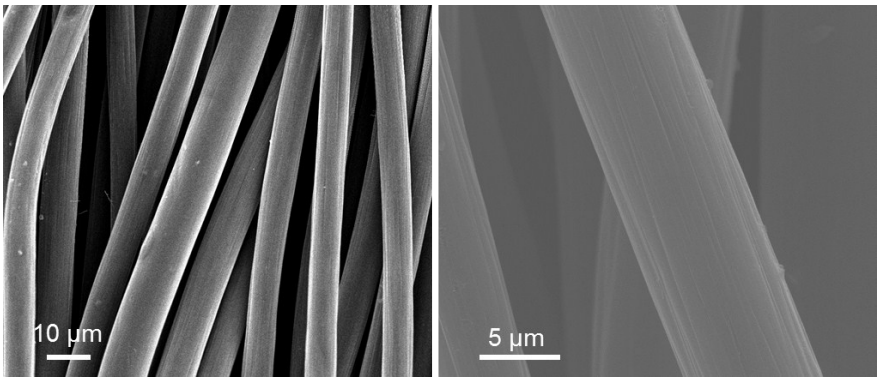

Fig. S1 SEM images of the carbon cloth.

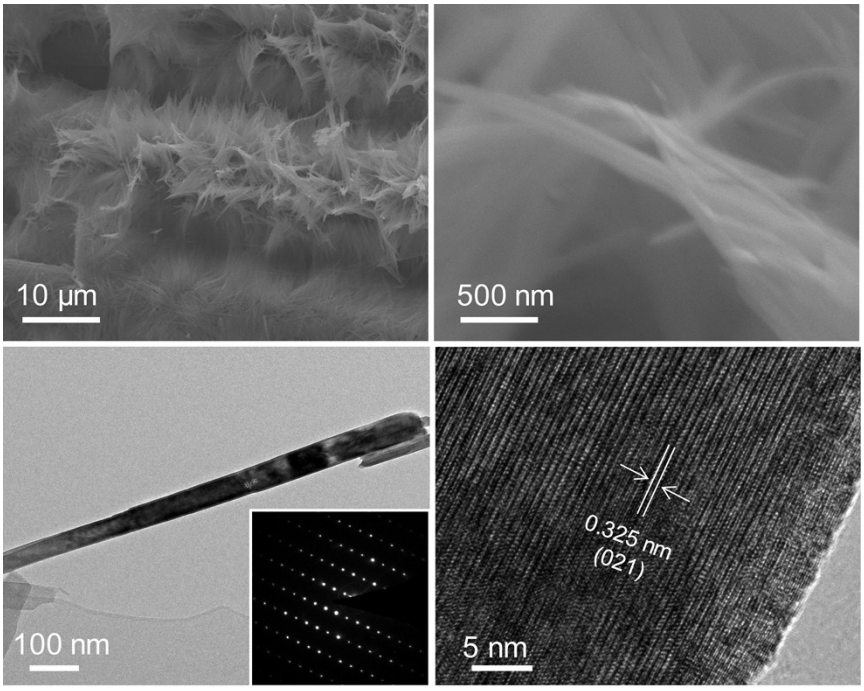

Fig. S2 (a, b)The SEM images (c) TEM image and (d) HRTEM image of the MoO_3 nanowires.

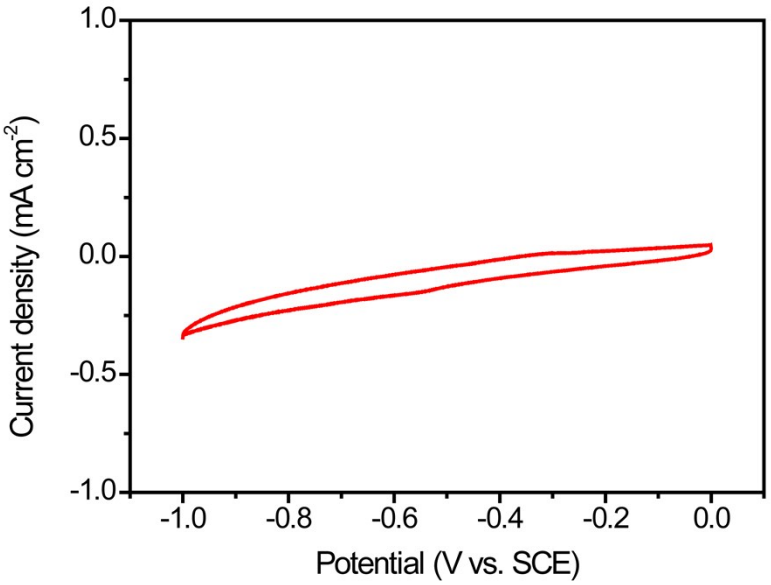

Fig. S3 CV curve of the carbon cloth at 100 mV s-1.

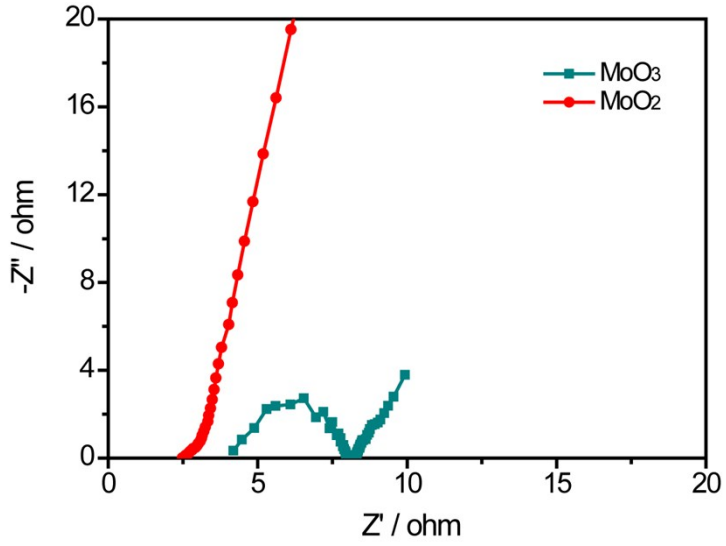

Fig. S4 The Nyquist plots of both the MoO_3 and MoO_2 electrodes.