The Synthesis of Shape-Controlled α-MoO_3 /Graphene Nanocomposites for High Performance Supercapacitors

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1. SEM and TEM images of pure MoO_3 amd MG-B-3

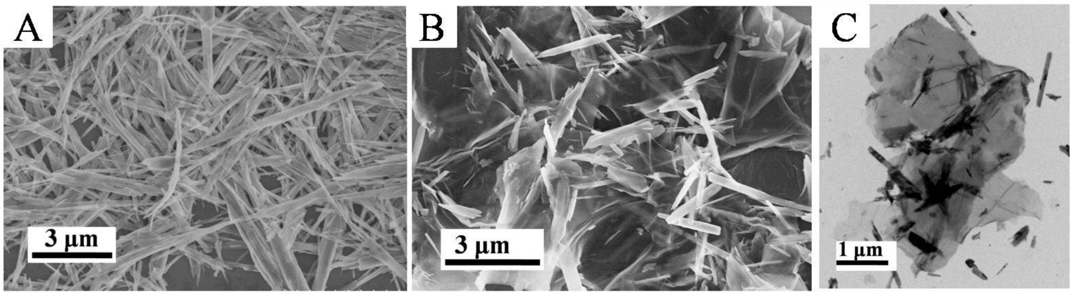

Fig. S1. SEM images of pure α-MoO_3(A) and MG-B-3(B), TEM images of MG-B-3(C)

Fig. S1A showed SEM image of α-MoO_3 nanobelts with smooth surface and varied from 3 μm to 10 μm in length. To obtain more information of the formation machnism, the contents of $(NH_4)_6Mo_7O_{24}\cdot 4H_2O$ and CTAB were tripled of the initial amount and the corresponding product was named as MG-B-3. Fig. S1B and S1C showed the SEM and TEM image of MG-B-3 that α-MoO_3 nanobelts attached on the surface of graphene and some even wrapped in transparent graphene sheets.

2. Electrochemical characterization

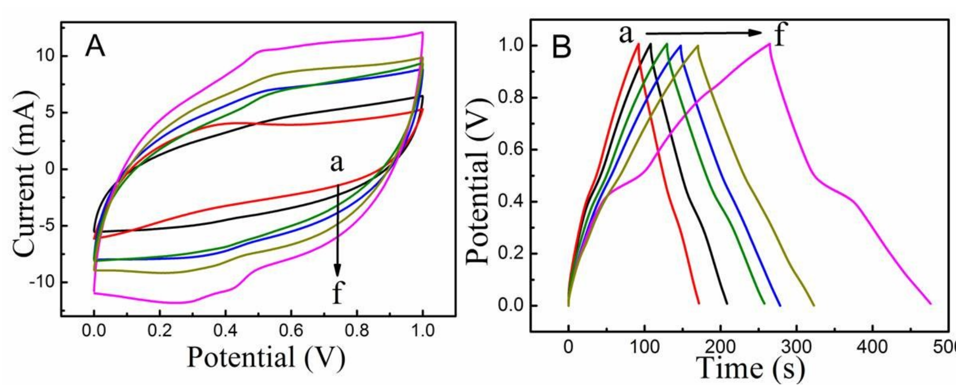

Fig. S2. CV curves at a scan rate of 100 $mV\cdot s^{-1}$(A) and GCD curves current density of 1 $A\cdot g^{-1}$(B) of α-MoO_3, graphene, MG-B-3, MG-F-1, MG-B-4 and MG-F-2 (from a to f in order).

Fig. S2A showed the CV curves of α-MoO_3, graphene, MG-B-3, MG-F-1, MG-B-4 and MG-F-2 at a scan rate of 100 $mV \cdot s^{-1}$. It is easy to distinguish the enclosed area of rGO and MoO_3 were smaller than all α-MoO_3 /graphene composites, implying α-MoO_3 /graphene composites delivered more outstanding capacitive than individual graphene and α-MoO_3. The calculated specific capacitance of α-MoO_3, graphene, MG-B-3, MG-F-1, MG-B-4 and MG-F-2 were 80.4, 101.4, 130.1, 132.0, 152.1 and 209.0 $F \cdot g^{-1}$, according to the GCD curves at 1 $A \cdot g^{-1}$ in Fig. S2A. The result showed that MG-F-2 had the highest specific capacitive that might be due to the structural superiority and optimum compositions.