Study on SnO_2/Graphene composites with superior electrochemical performance for Lithium-ion batteries

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Supplementary Information

Fig. S1 SEM images of the composite **I** (a), (b); composite **II** (c), (d) and composite **III** (e), (f).

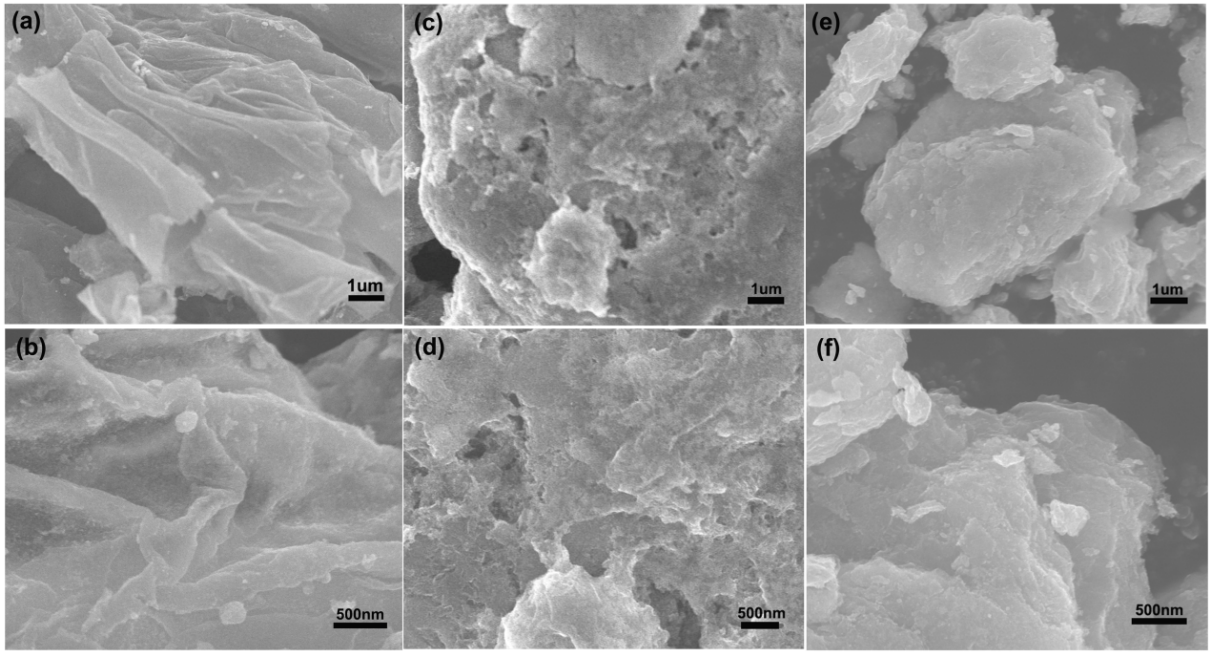
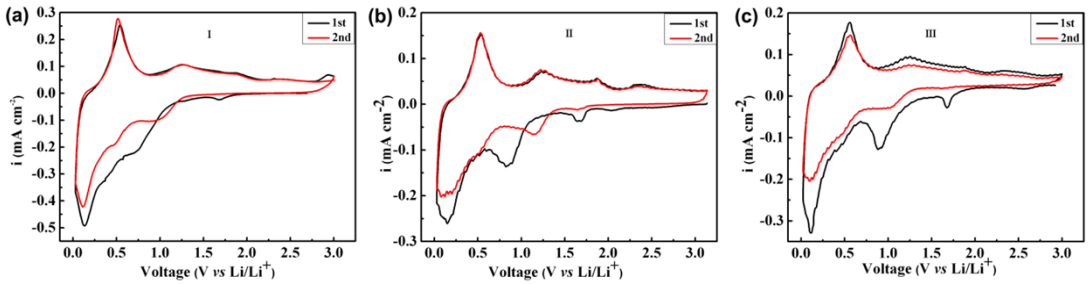


Fig. S1 shows SEM images of the three composites. It was found that only composite **I** exhibited the typical morphology of graphene (The mass fractions of rGO in the three composites are very close). RGO was completely embedded in the composite for the other two samples. The morphology of composite **I** indicated that both SnO_2 nanoparticles and GO were well dispersed during synthesis.

Fig. S2 CV curves of composite **I** (a)); composite **II** (b) and composite **III** (c). Scan rate was 0.05 mV s^{-1} in all cases.



CV behaviors for the three samples are generally consistent with that reported previously. There are two dominant redox pairs that can be clearly observed in all cases. The first pair that located at 0.13 V (cathodic) and 0.5 V (anodic) is attributed to the alloying and dealloying processes. The second pair located at ~1.0 V and ~1.25 V refers to the reaction of $SnO_2 + 4Li^+ + 4e^- = 2Li_2O + Sn$. The peak locations of these two redox pairs for the three composites are slightly different due to different natures of the composites that resulted from synthetic conditions.