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Supporting Information

Enhanced electrochemical properties of graphene-wrapped $ZnMn_2O_4$ nanorods for lithium-ion batteries

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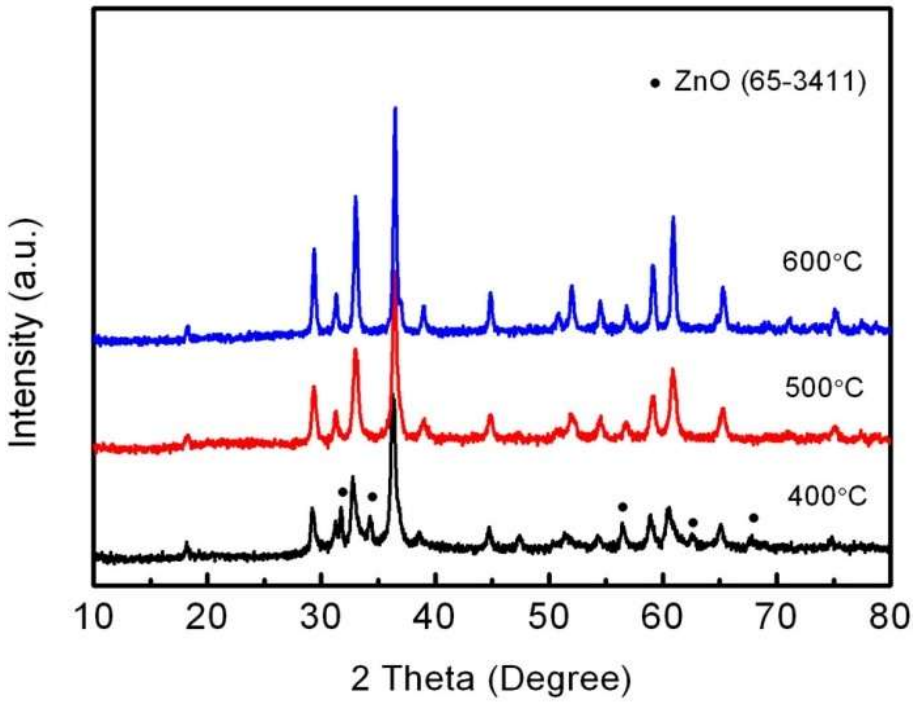

Fig.S1 XRD patterns of $ZnMn_2O_4$ nanorods prepared at different temperatures: 400, 500 and 600 °C.

The electrospun precursor fibers were sintered at 400, 500 or 600 °C in air for 4h with a heating rate of 2 °C/min. As shown in Fig. S1, there are a lot of visible ZnO

(JCPDS NO. 65-3411) impurities existing in the sample obtained at 400 °C. In comparison, relatively pure and well-defined $ZnMn_2O_4$ crystals can be obtained at 500 °C and the diffraction peaks become sharper when the temperature rises to 600 °C, indicating a larger crystal size of $ZnMn_2O_4$ at 600 °C.

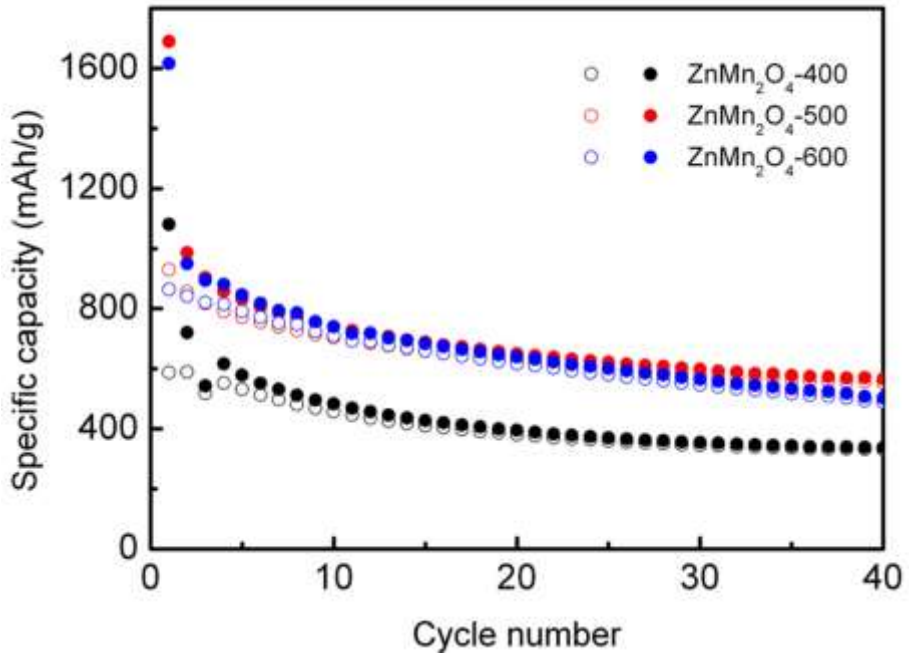

Fig.S2 The specific capacity as a function of cycle number for $ZnMn_2O_4$ nanorods prepared at different temperatures under a current density of 100 mA/g.

Fig.S2 shows the charge-discharge capacities of $ZnMn_2O_4$ nanorods prepared at different temperatures under a current density of 100 mA/g and at 0.01-3.0 V. All three samples present a large first discharge capacity, and the capacity decreases sharply during the first ten cycles and then keeps steady in the following cycles. Among them, $ZnMn_2O_4$-500 and $ZnMn_2O_4$-600 display similar reversible capacity around 550 mAh/g after 40 cycles, while $ZnMn_2O_4$-400 only retains 340 mAh/g after 40 cycles. For the $ZnMn_2O_4$-400 sample, the capacity loss may be due to the poor crystallinity and defect of $ZnMn_2O_4$ structure caused by a low sintering temperature and ZnO impurity. Given all above, we choose $ZnMn_2O_4$-500 as the basic material for investigating the effects of RGO wrapping and post-heat treatment on the electrochemical properties of $ZnMn_2O_4$ material.

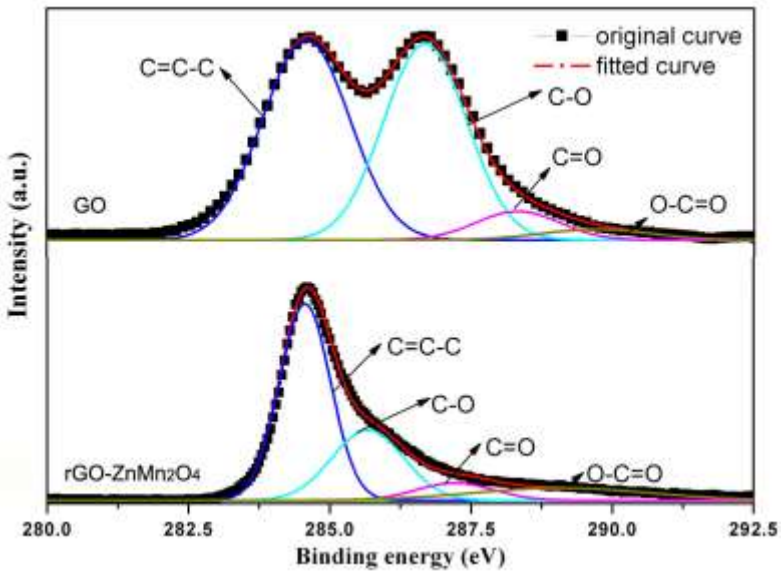

Fig.S3 The C1s XPS spectra of GO and rGO-$ZnMn_2O_4$