Supporting Information for

**Spherical Sn-Fe$_3$O$_4@$graphite composite as long-life and high-rate-capability anode for lithium ion batteries**

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Fig. S1 (a) The SEM image of the Sn-Fe₃O₄@G composite powder, and the corresponding elemental mapping of (b) C, (c) Sn, (d) O and (e) Fe.

Compared with the elemental mapping of C dispersion (Fig. S1 (b)) and the SEM image (Fig. S1 (a)), it can prove that the sheet shape matrix is graphite. Moreover, it is clear that the dispersion of Sn is highly homogenous (Fig. S1 (c)). It is contributed to the combined effects of heating and stress during the P-milling process. The same dispersion of O (Fig. S1 (d)) and Fe (Fig. S1 (e)) represents the distribution of the Fe₃O₄. The Sn and Fe₃O₄ particles mainly disperse within the graphite matrix.
Fig. S2 The cycling performances of the Sn-Fe₃O₄@C composites at potential range between 0.01-2V.
Fig. S3 The comparative morphology evolution of the electrode surface for the Sn-Fe$_3$O$_4$@C composite electrodes: the secondary electron SEM images of (a) the pristine Sn-Fe$_3$O$_4$@C composite electrode and (b) the Sn-Fe$_3$O$_4$@C composite electrode for 50 cycling tests.