**Fig. S1** The XPS spectra of Ni$_3$S$_4$/CNFs in the region of O 1s.

**Fig. S2** (a) The discharge time of single electrode at 5 A g$^{-1}$ and (b) cycle performance of Ni-Zn batteries with different contents of CNFs at current density of 5 A g$^{-1}$.

**Fig. S3** (a) The discharge time of single electrode at 5 A g$^{-1}$ and (b) the cycle performance of Ni$_3$S$_4$/CNFs/Zn, Ni$_3$S$_4$-CNFs/Zn and Ni$_3$S$_4$/Zn at the current density of 5 A g$^{-1}$.

**Fig. S4** The cycle performance curves of Ni$_3$S$_4$/CNFs/Zn and Ni$_3$S$_4$/CNFs-without G/Zn at current density of 5 A g$^{-1}$

**Fig. S5** The photo of disassembling from Ni$_3$S$_4$/CNFs//Zn and Ni$_3$S$_4$-CNFs//Zn SEM micrographs of (b) Zn electrode; (c) cathode electrode of Ni$_3$S$_4$/CNFs and (e) Zn electrode; (f) cathode electrode of Ni$_3$S$_4$-CNFs after 100 cycles.
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