Electronic Supplementary Information

Aqueous Li-ion Cells with Superior Cycling Performance Using Multi-channeled Polyaniline/Fe$_2$O$_3$ Nanotube Anodes

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**Figure S1.** SEM images of ANI-Mo$_3$O$_{10}$ NWs (a), MoO$_x$/PANI NWs (b), de-doped PANI NTs (c) and PANI/Fe$_2$O$_3$ NTs (d), respectively.
**Figure S2.** FESEM images of re-doped PANI NTs (a-c) and PANI/Fe$_2$O$_3$ NTs (d-e).

**Figure S3.** (a) Scanning transmission electron microscopy (STEM) image of the end of a single NT. (b-e) The EDS mapping analysis images of Fe (red), C (green), O (orange) and N (white) at the same position. (f, g) EDS spectra of ANI-Mo$_3$O$_{10}$ NWs and PANI/Fe$_2$O$_3$ NTs, indicting the complete elimination of MoO$_x$. 
Figure S4. XRD pattern of ANI-Mo$_3$O$_{10}$ (Mo$_3$O$_{10}$(C$_6$H$_8$N)$_2$·2H$_2$O) NWs (JCPDS NO. 50-2402).

Figure S5. Nitrogen sorption isotherm (a) and pore size distribution (b) of PANI/Fe$_2$O$_3$ NTs.
**Figure S6.** (a) The cyclic performances comparison between PANI/Fe$_2$O$_3$ and re-doped PANI within 100 cycles. (b) The rate cyclic performance of (PANI/Fe$_2$O$_3$)//LiMn$_2$O$_4$ cell.

**Figure S7.** The initial charge/discharge curves (a) and cyclic performances (b) of (MoO$_x$/PANI)//LiMn$_2$O$_4$ ARLIBs tested at the range of 1.4—0.05 (red) and 1.85—0.05 V (black).
Figure S8. SEM images of fresh PANI/Fe$_2$O$_3$ NTs electrode (a) and the same sample after 70 cycles of charge and discharge. (c) Optical images of the separators in three different cell using MoO$_x$/PANI NWs, re-doped PANI NTs, and PANI/Fe$_2$O$_3$ NTs as the anodes, respectively.