Electronic Supplementary Information

Peptide-Templated Synthesis of Branched MnO$_2$ Nanowires with Improved Electrochemical Performances

Mingxuan Du,$^a$ Yong Bu,$^a$ Yan Zhou,$^b$ Yurong Zhao,$^a$ Shengjie Wang,*$^a$ and Hai Xu*$^a$

$^a$ State Key Laboratory of Heavy Oil Processing and Center for Bioengineering and Biotechnology, China University of Petroleum (East China), No. 66 Changjiang West Road, Qingdao 266580, China

$^b$ College of Science, China University of Petroleum (East China), No. 66 Changjiang West Road, Qingdao 266580, China.
Fig. S1 (a) Molecular structure of I₃K and (b) TEM image of I₃K nanofibers. The three Ile residues are marked in green and the Lys group at the C-terminal in red for clarity. Inset of (b) shows the statistical diameter histogram of the I₃K nanofibers.
Fig. S2 (a) TEM and (b) HR-TEM images of the MnO$_2$ precipitates formed in the absence of peptide (MP-0). Inset of (a) indicates the size distribution of the formed urchin-like MnO$_2$ spheres.
Fig. S3 FTIR spectrum of the collected MnO$_2$ precipitates in the presence of I$_3$K nanofibers (MP-5).
Fig. S4 The diameter distributions of the formed MnO$_2$ hybrid nanowires: (a) MP-2, (b) MP-3, (c) MP-4, (d) MP-5, (e) MP-6, and (f) MP-7.
**Fig. S5** TGA curves of MP-5 and the urchin-like MnO$_2$ sphere (MP-0) prepared in the absence of I$_3$K assemblies. The heating rate was set as 20 °C min$^{-1}$. 
Fig. S6 (a) N$_2$ adsorption/desorption isotherm and (b) BJH pore size distribution of MP-0.
Fig. S7 (a) N1s XPS spectrum of the branched MnO$_2$ nanowire (MP-5) and (b) The UV-vis absorbance at 526 nm as a function of time for different reaction systems.
Fig. S8 The anodic peak current versus the square root of scan rate for the branched MnO$_2$ nanowire (MP-5), showing a linear relationship between them.
Fig. S9 (a) CV curves of the branched MnO$_2$ nanowire (MP-5) as the electrode material in aqueous 1 M Na$_2$SO$_4$ at different scan rates and (b) Variation of its specific capacitance with the scan rate.