Supplementary Information For

Photoelectrocatalytic activity of flexible PEDOT-PSS/silicon carbide nanowire films

Xin Liao a, Zhaoxiang Liu a, Lijuan Ding a, Jianjun Chen a,b,* , Weihua Tang c,*

a Engineering Research Center for Eco-Dyeing & Finishing of Textiles, Ministry of Education, Zhejiang Sci-Tech University, Hangzhou 310018, China
b Department of Materials Forming and Control Engineering, College of Machinery and Automation, Zhejiang Sci-Tech University, Hangzhou 310018, China
c School of Science, Beijing University of Posts and Telecommunications, Beijing 100876, China

* Corresponding author: E−mail: chen@zstu.edu.cn (J.J. Chen); whtang@bupt.edu.cn

(W.H. Tang); Tel: +86−571−86843265
Fig. S1 XRD patterns (A) of the pristine SiC and the SiC-4.5 wt%-PEDOT/PSS film; the digital photo (B) of the SiC-PEDOT/PSS flexible film.
Fig. S2 TEM image (A) and HRTEM image (B) of the pristine SiC.
Fig. S3 UV-Vis spectra of the pristine PEDOT/PSS.
Fig. S4 FT-IR spectrum of the as-prepared SiC NWs (a) and the as-prepared SiC-4.5 wt% PEDOT/PSS (b). The peak at about 800 cm$^{-1}$ can be corresponded to the Si–C stretching vibration.\textsuperscript{1} Particularly, PSS is usually identified by sulfonate group with the vibrations at about 1036 cm$^{-1}$ and 1176 cm$^{-1}$.\textsuperscript{2} The bands at around 1138 cm$^{-1}$, 1459 cm$^{-1}$ and 1527 cm$^{-1}$ are contributed from the stretching of ethylenedioxy group, the C=C symmetric and asymmetric stretching of the thiophene ring, respectively.\textsuperscript{3,4} Additionally, the peaks appeared at 685 cm$^{-1}$ and 975 cm$^{-1}$ are attributed to the C–S bond, and the peak at 1311 cm$^{-1}$ is ascribed to the C–C stretching.\textsuperscript{2,5-6} The inverted signal at about 900 cm$^{-1}$ is ascribed to the bending mode of C–H bond.\textsuperscript{7}
Fig. S5 XPS spectra of S 2p of the pristine PEDOT/PSS (A) and the SiC-4.5 wt%-
PEDOT/PSS (B).
Fig. S6 Current density of SiC-PEDOT/PSS photoelectrodes (A), pristine SiC and PEDOT/PSS (B) under the simulated solar light in Na$_2$S/Na$_2$SO$_3$ electrolyte.
Fig. S7 (A) Recycling experiments of photocatalytic H₂ evolution using the SiC-4.5 wt%-PEDOT/PSS photocatalyst. (B) IPCE spectra for pristine SiC and SiC-4.5 wt%-PEDOT/PSS photoelectrodes.
Fig. S8 PL spectra of the pristine SiC (black line), SiC-1 wt%-PEDOT/PSS (blue line), SiC-10 wt%-PEDOT/PSS (red line) and SiC-4.5 wt%-PEDOT/PSS (magenta line).
Fig. S9 Schematic illustration of the photoexcited charge-transfer process on the SiC-PEDOT/PSS photocatalyst.
References


