Electronic Supplementary Material (ESI) for RSC Advances.

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

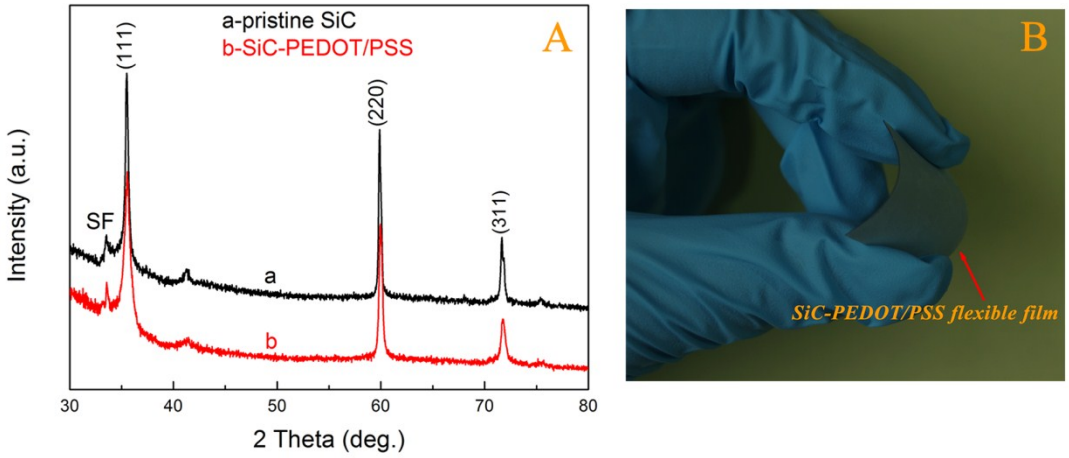

Fig. S1 XRD patterns (A) of the pristine SiC and the SiC-4.5 wt%-PEDOT/PSS film; the digital photo (B) of the SiC-PEDOT/PSS flexible film.

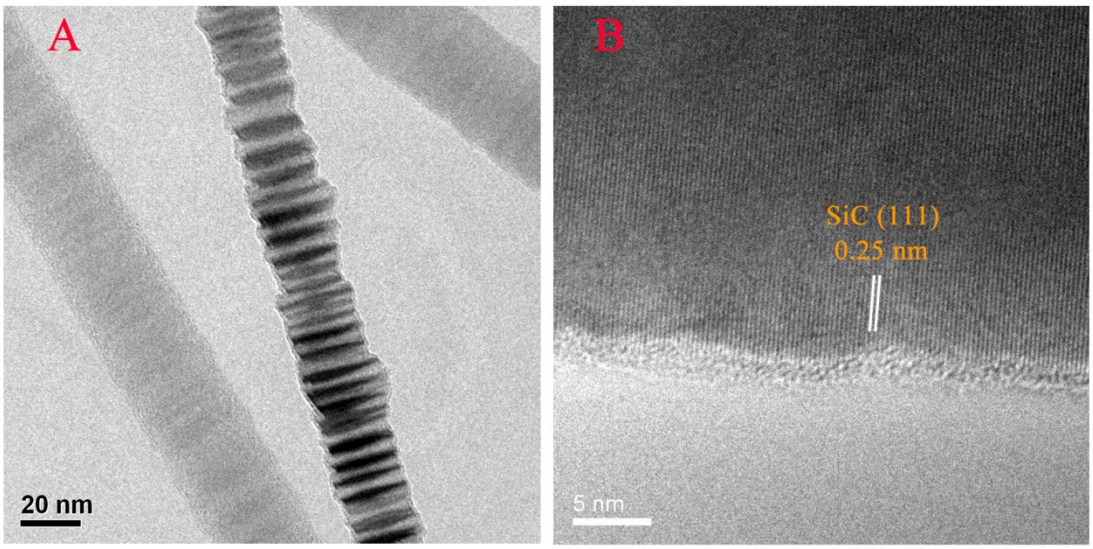

Fig. S2 TEM image (A) and HRTEM image (B) of the pristine SiC.

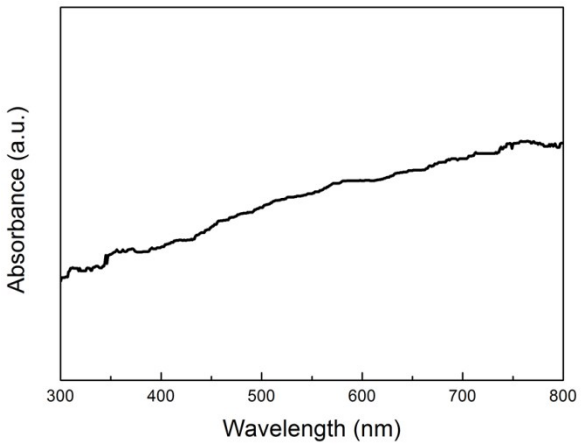

Fig. S3 UV-Vis spectra of the pristine PEDOT/PSS.

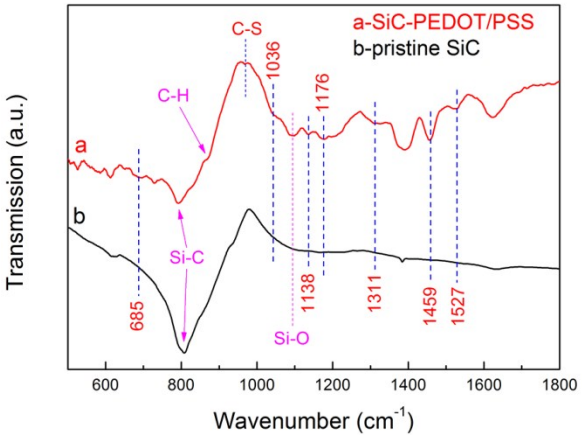

Fig. S4 FT-IR spectrum of the as-prepared SiC NWs (a) and the as-prepared SiC-4.5 wt%-PEDOT/PSS (b). The peak at about 800 cm^{-1} can be corresponded to the Si−C stretching vibration.[1] Particularly, PSS is usually identified by sulfonate group with the vibrations at about 1036 cm^{-1} and 1176 cm^{-1}.[2] 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.[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.[2,5-6] The inverted signal at about 900 cm^{-1} is ascribed to the bending mode of C−H bond.[7]

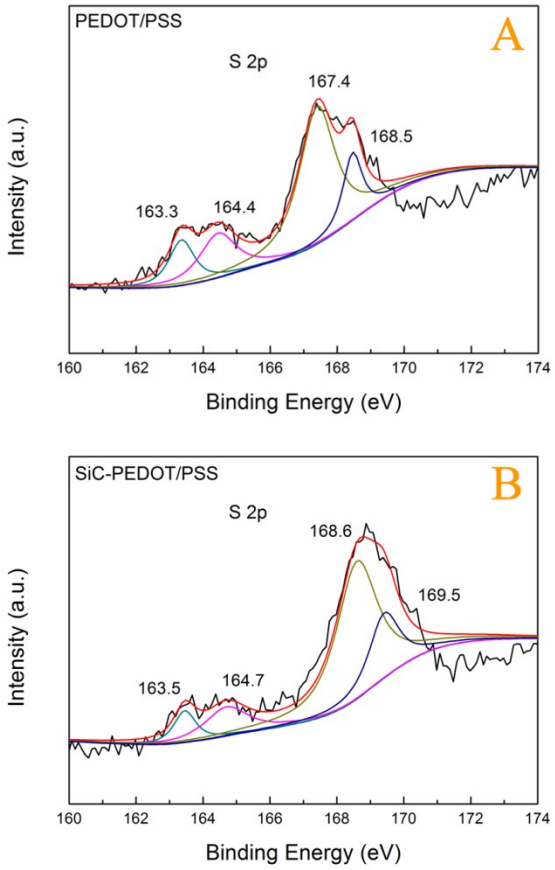

Fig. S5 XPS spectra of S 2p of the pristine PEDOT/PSS (A) and the SiC-4.5 wt%-PEDOT/PSS (B).

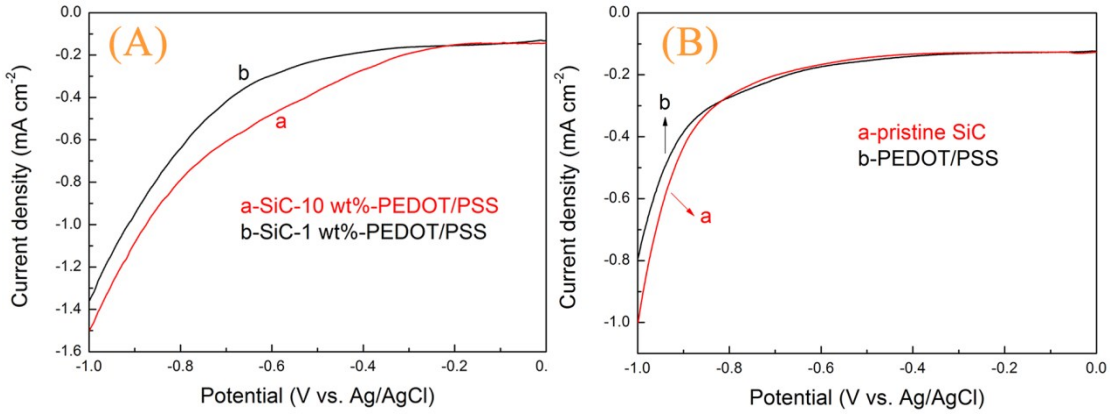

Fig. S6 Current density of SiC-PEDOT/PSS photoelectrodes (A), pristine SiC and PEDOT/PSS (B) under the simulated solar light in Na_2S/Na_2SO_3 electrolyte.

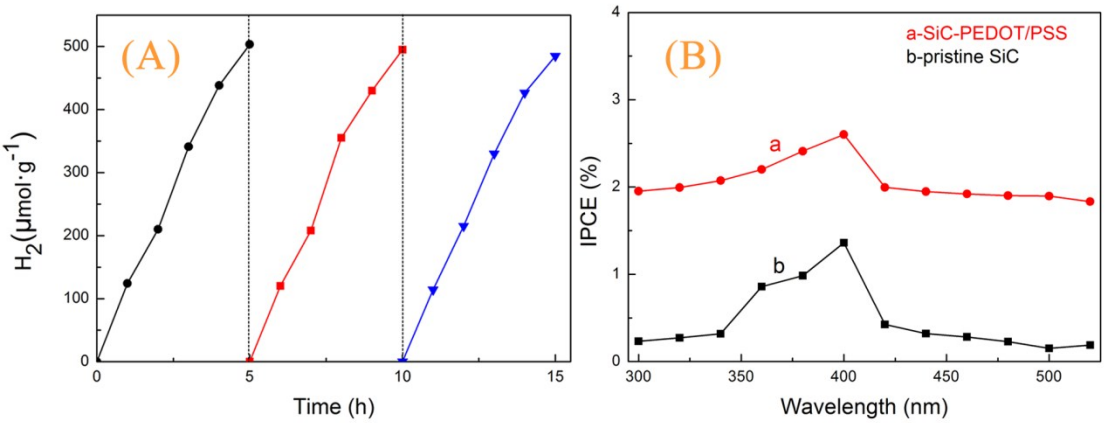

Fig. S7 (A) Recycling experiments of photocatalytic H_2 evolution using the SiC-4.5 wt%-PEDOT/PSS photocatalyst. (B) IPCE spectra for pristine SiC and SiC-4.5 wt%-PEDOT/PSS photoelectrodes.

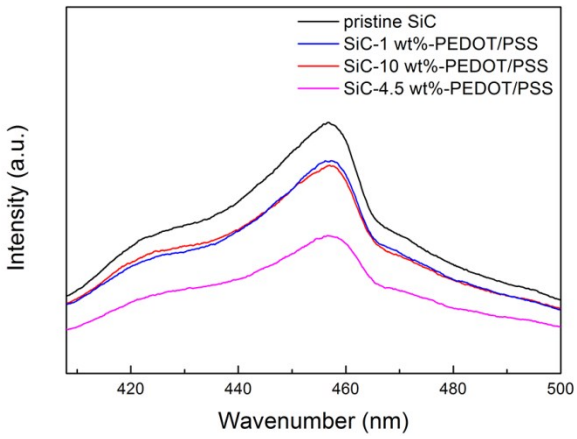

Fig. S8 PL spectra of the pristine SiC (black line), SiC-1 wt%-PEDOT/PSS (blue line), SiC-10 wt%-PEDOT/PSS (red line) and SiC-4.5 wt%-PEDOT/PSS (magenta line).

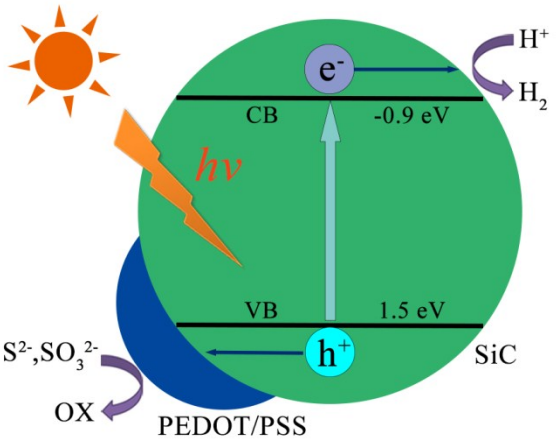

Fig. S9 Schematic illustration of the photoexcited charge-transfer process on the SiC-PEDOT/PSS photocatalyst.

References

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