Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Supporting Information

Tuning the Surface Charge Density of Exfoliated Thin Molybdenum Disulfide Sheets via Non-Covalent Functionalization for Promoting Hydrogen Evolution Reaction

Wei-Ming Huang,[a] *Wei-Sheng Liao,*[a] *Yan-Ming Lai,*[a] *I-Wen Peter Chen**[a]
Dr. I-W. P. Chen, W.-M. Huang
Department of Applied Science, National Taitung University, Taitung City (95092), Taiwan
E-mail: iwchen@nttu.edu.tw

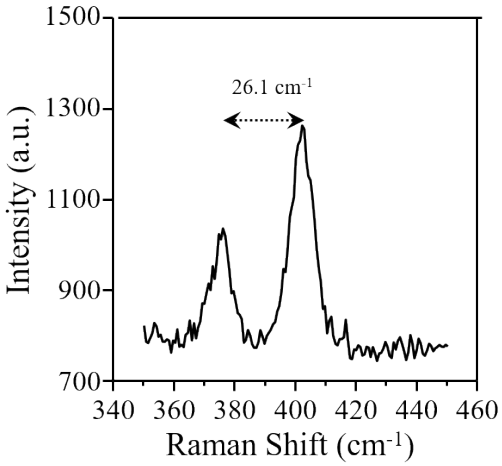

Figure S1. Characteristic peaks of Raman spectra for bulk MoS_2.

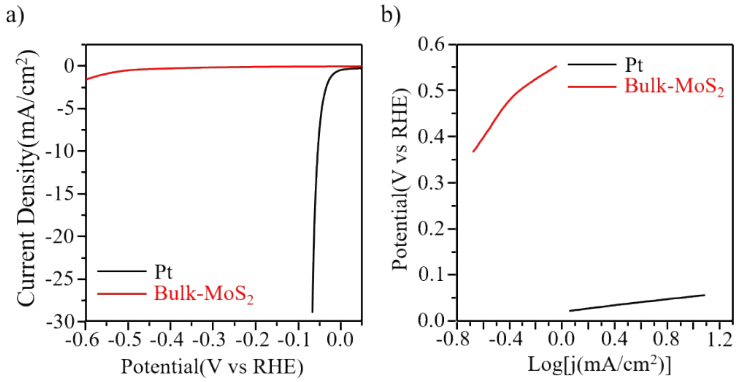

Figure S2. a) LSV and b) Tafel plots of Pt and bulk-MoS_2.

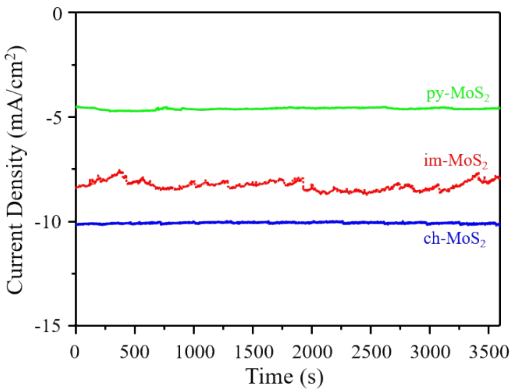

Figure S3. Chronoamperometric response recorded from the py-MoS_2, im-MoS_2, and ch-MoS_2 electrode at a constant potential of -400 mV, -300 mV, and -200 mV, respectively.

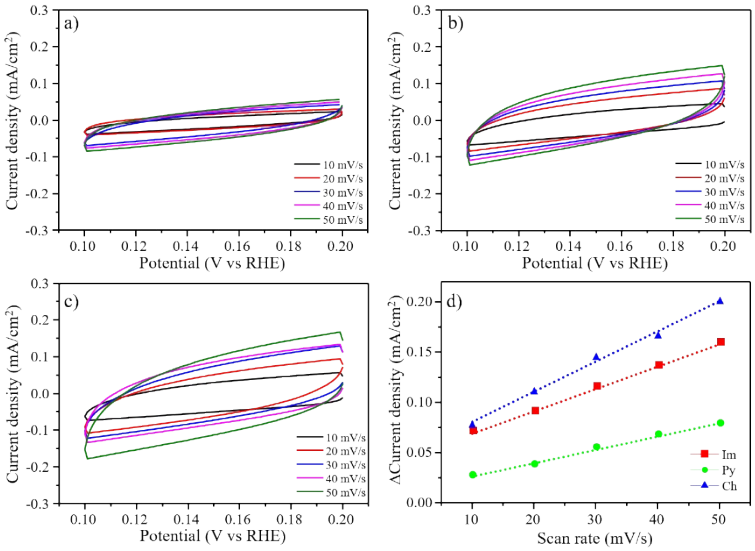

Figure S4. Cyclic voltammetry curves in the region of 0.1 ~ 0.2 V vs. RHE for a) py-MoS_2, b) im-MoS_2, c) ch-MoS_2. d) Capacitive currents at 150 mV as a function of scan rate for py-MoS_2, im-MoS_2, and ch-MoS_2.

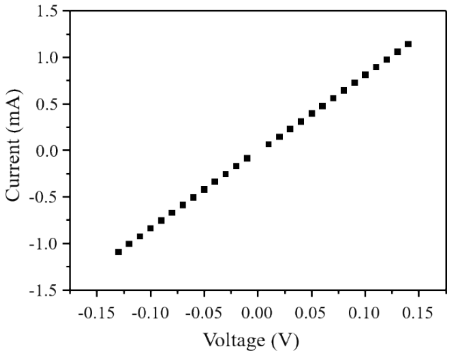

Figure S5. Electrical conductivity of 2 cm (width) x 2cm (length) ch-MoS_2/CNTs paper (thickness: 20 μm).

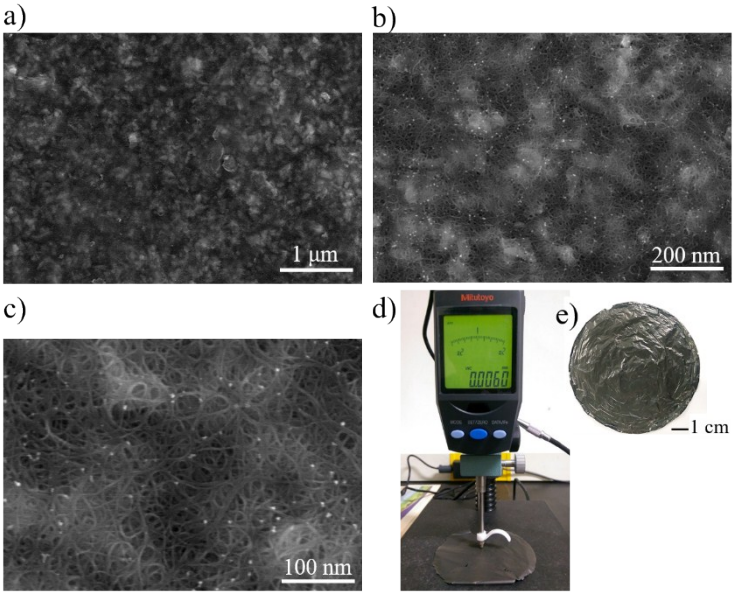

Figure S6. SEM images of the ch-MoS_2/PtNPs/CNTs. a) Low and b)-c) High magnification. d) Thickness measurement of the ch-MoS_2/PtNPs/CNTs paper electrode (unit: mm). e) Photograph of the ch-MoS_2/PtNPs/CNTs.

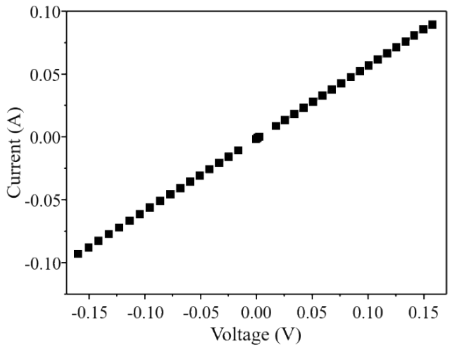

Figure S7. Electrical conductivity of ch-MoS_2/PtNPs/CNTs paper.

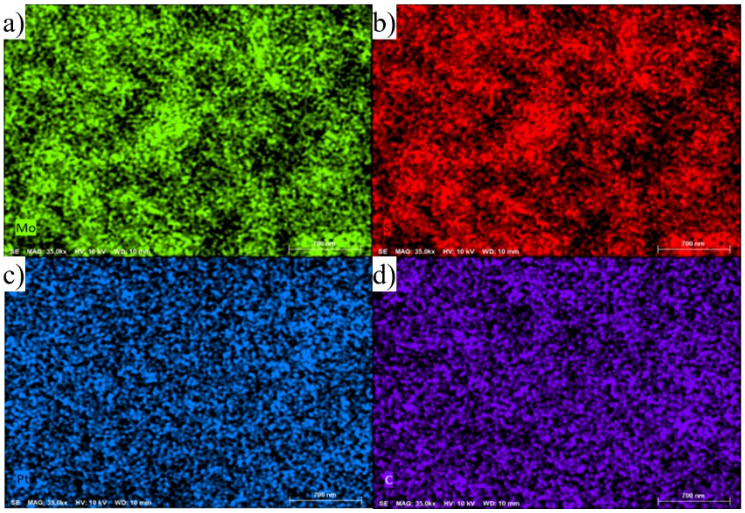

Figure S8. EDS mapping images of a) Mo, b) S, c) Pt, and d) C of the ch-MoS_2/PtNPs/CNTs paper.

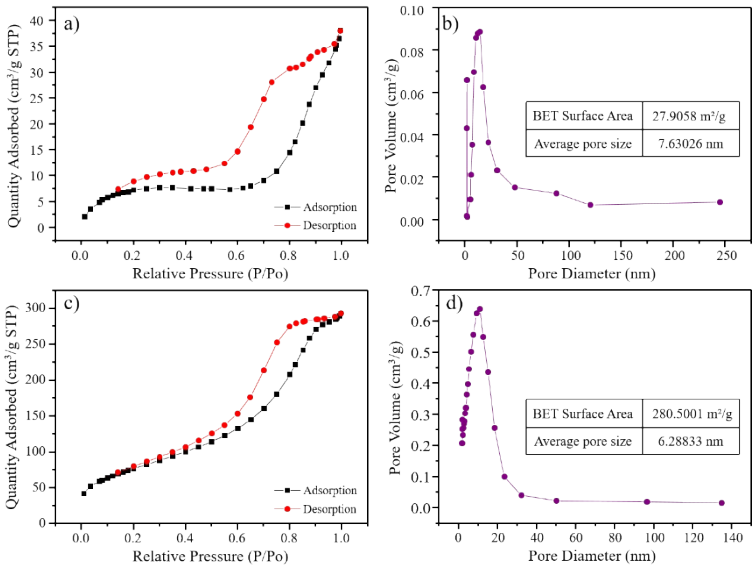

Figure S9. a) N_2 adsorption/desorption isotherms and b) pore size distribution of ch-MoS_2/CNTs. c) N_2 adsorption/desorption isotherms and d) pore size distribution of ch-MoS_2/PtNPs/CNTs.

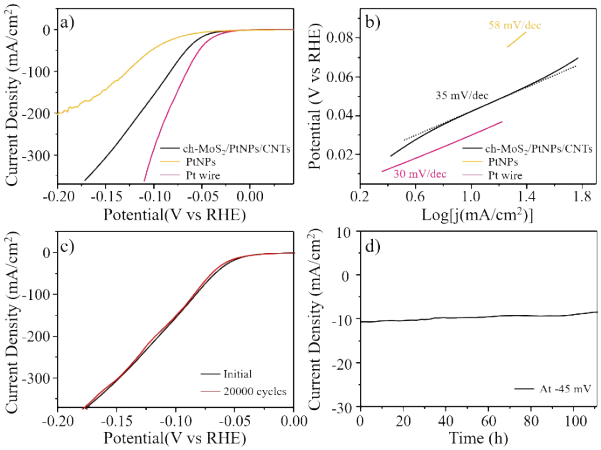

Figure S10. a) LSV, b) Tafel slope, c)-d) HER stability measurements for the flexible ch-MoS_2/PtNPs/CNTs electrode.

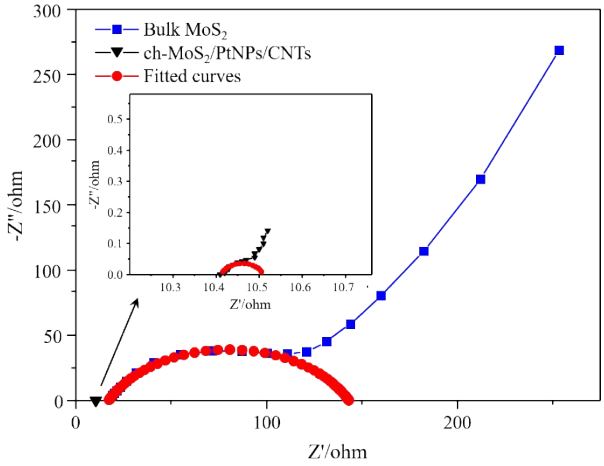

Figure S11. Electrochemical impedance spectroscopy (EIS) curves of ch-MoS_2/PtNPs/CNTs and bulk MoS_2.

Table S1. EDS analysis of the ch-MoS_2/PtNPs/SWCNT paper.

Element	Atom (%)
Platinum	0.52
Molybdenum	3.54
Sulfur	6.86
Carbon	86.12
Oxygen	2.93