Electronic Supplementary Information (ESI)

[001] preferentially-oriented 2D tungsten disulfide nanosheets as anode materials for superior lithium storage

Wanfeng Yang,[a] Jiawei Wang,[b] Conghui Si,[a] Zhangquan Peng,[b]Jan Frenzel,[c] Gunther Eggeler,[c] Zhonghua Zhang*[a]

[a]Key Laboratory for Liquid-Solid Structural Evolution and Processing of Materials (Ministry of Education), School of Materials Science and Engineering, Shandong University, Jingshi Road 17923, Jinan, 250061, P.R. China

[b]State Key Laboratory of Electroanalytical Chemistry, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, Jilin 130022, P.R. China

[c]Institut für Werkstoffe, Ruhr Universität Bochum, Bochum 44780, Germany

*Corresponding author. Email: zh_zhang@sdu.edu.cn (Z. Zhang), Tel/Fax: +86-531-88396978.

Supplementary Figures (Figures S1-S5) and Tables (Table S1-S2)

References	Our work	[35]	[51]	[39]	[38]	[49]	[36]	[52]	[53]
Current density A g^{-1}	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.035
Coulombic efficiency	77.5%	48%	49.1%	53.7%	61.4%	67.5%	68%	70%	72.4%

Table S1. The initial Coulombic efficiency of WS_2 or the composite electrodes in recent years.

State	R_e (Ω)	R_{sei} (Ω)	R_{ct} (Ω)
Before cycling	3.3	/	135.6
After the 20th cycle	4.2	6.6	29.6

Table S2. Fitting results obtained from the EIS data in **Figure 7**.

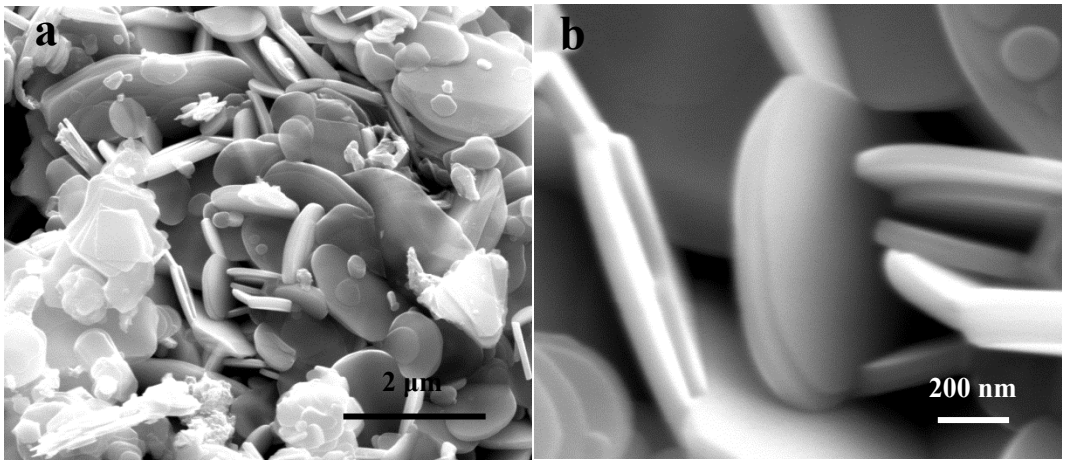

Figure S1. SEM images with various magnifications of the as-prepared WS_2 nanosheets.

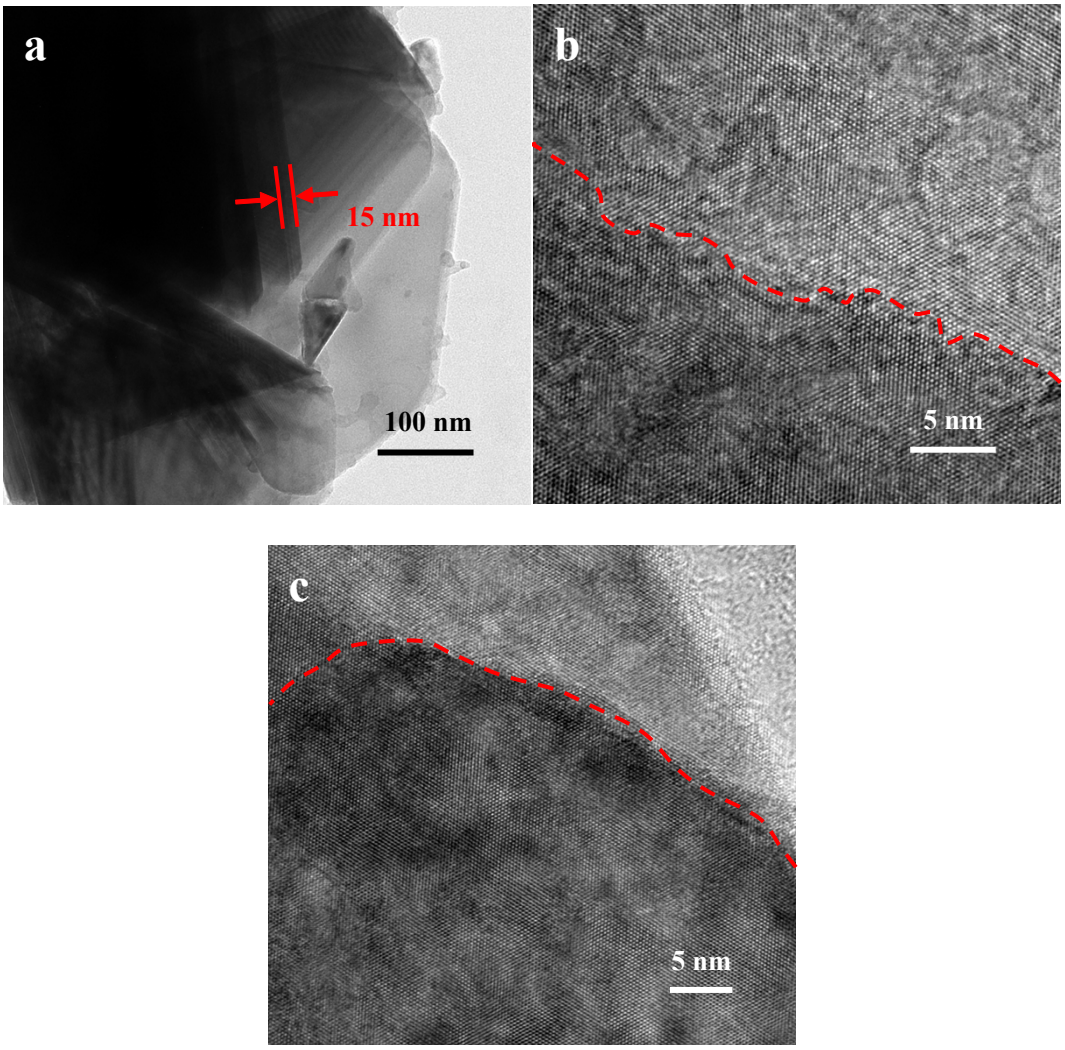

Figure S2. (a) Low-magnification TEM image, and (b, c) HRTEM images of the WS_2 nanosheets.

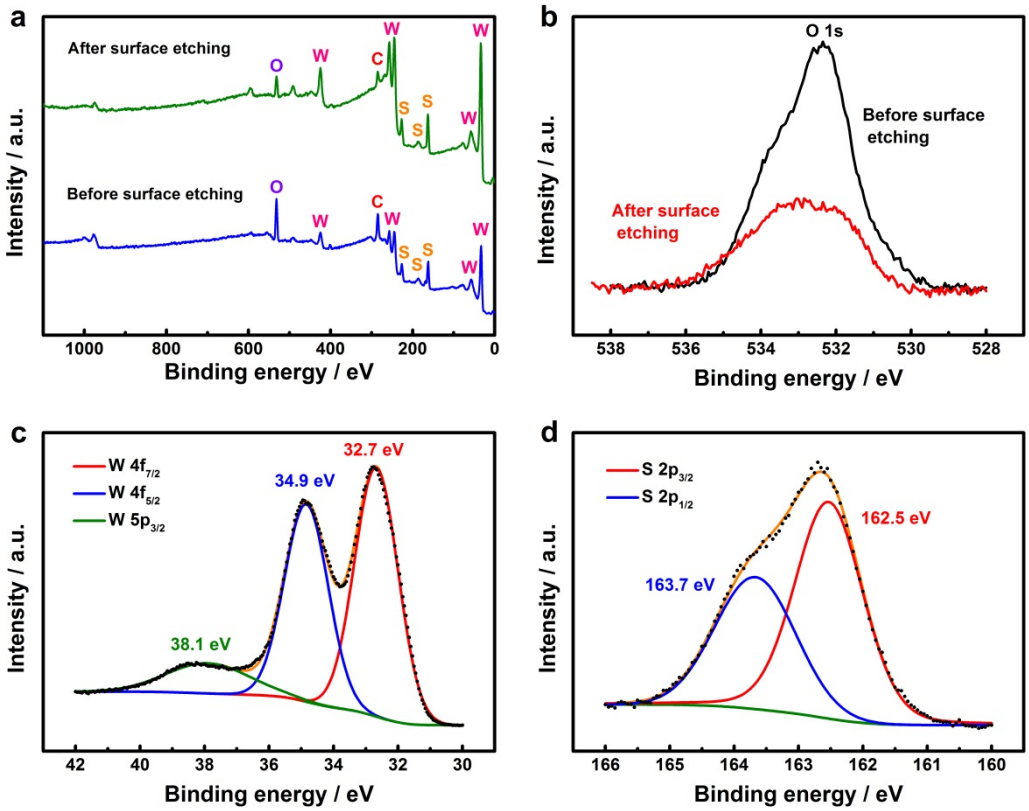

Figure S3. (a) XPS broad scan spectra of the WS_2 nanosheets before and after the surface etching by Ar^+ sputtering. XPS spectra of (b) O 1s before and after the surface etching, (c) W 4f and W 5p, and (d) S 2p for the WS_2 nanosheets after the surface etching by Ar^+ sputtering.

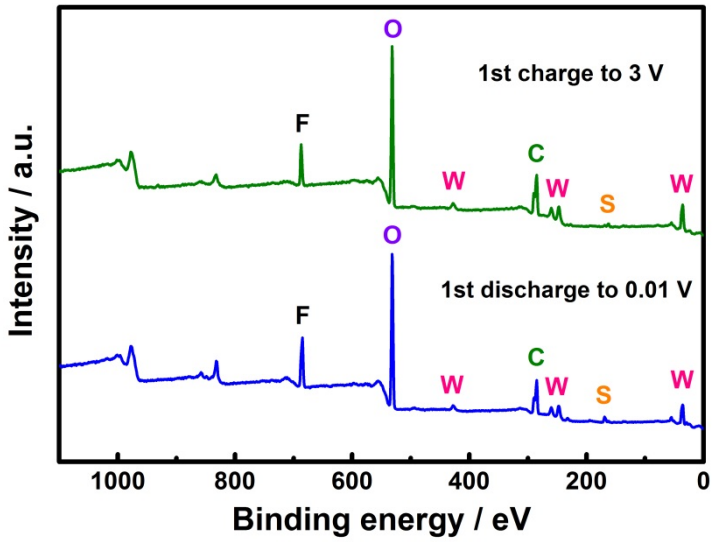

Figure S4. XPS broad scan spectra of the WS_2 nanosheets at the state of "g" (1st discharge to 0.01 V) and "h" (1st charge to 3 V).

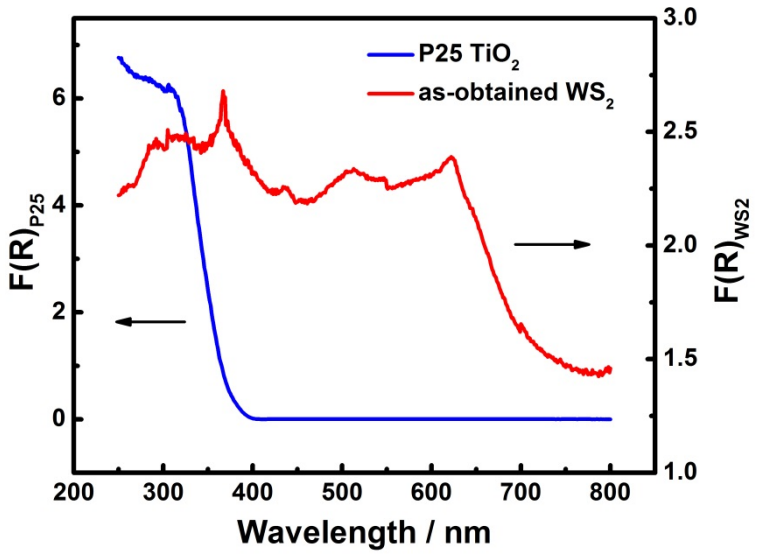

Figure S5. UV-vis DRS spectra of the P25 TiO_2 and WS_2 nanosheets plotted as the Kubelka-Munk function of the reflectance (R).