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

Supporting information

Immobilization of tungsten disulfide nanosheets on active carbon fiber as electrode materials for high performance quasi-solid-state asymmetric supercapacitors

Xiaoming Qiu, Luning Wang, Li-Zhen Fan*

Beijing Advanced Innovation Center for Materials Genome Engineering, Institute of Advanced Materials and Technology, University of Science and Technology Beijing, Beijing 100083, China

*Corresponding author: E-mail: fanlizhen@ustb.edu.cn

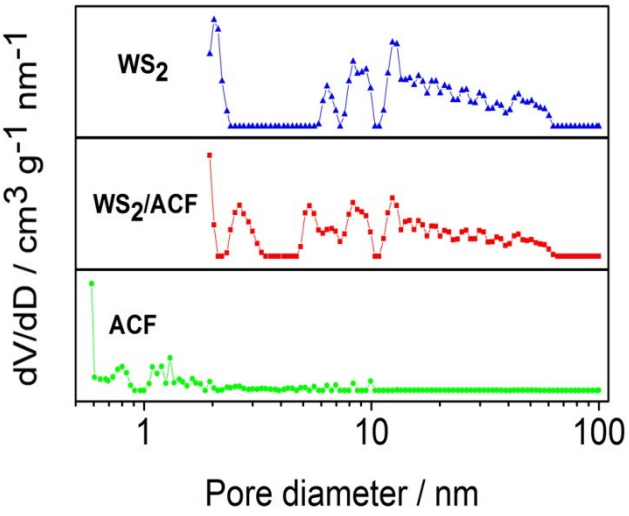

Fig. S1 Pore size distribution of pure ACF, WS_2 and WS_2/ACF calculated from the absorption−desorption isotherm using density functional theory (DFT) method.

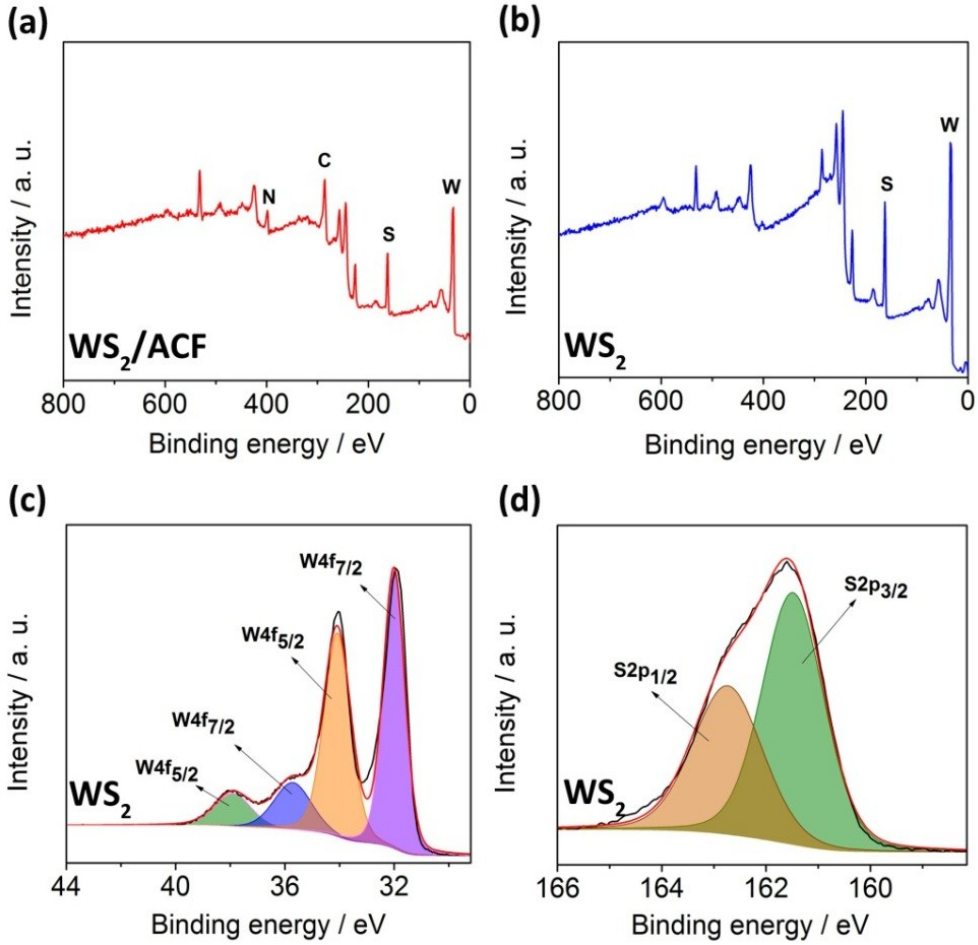

Fig. S2 XPS spectra of WS_2/ACF (a) and pure WS_2 (b). High resolution XPS spectra of W4f (c) and S2p (d) for pure WS_2.

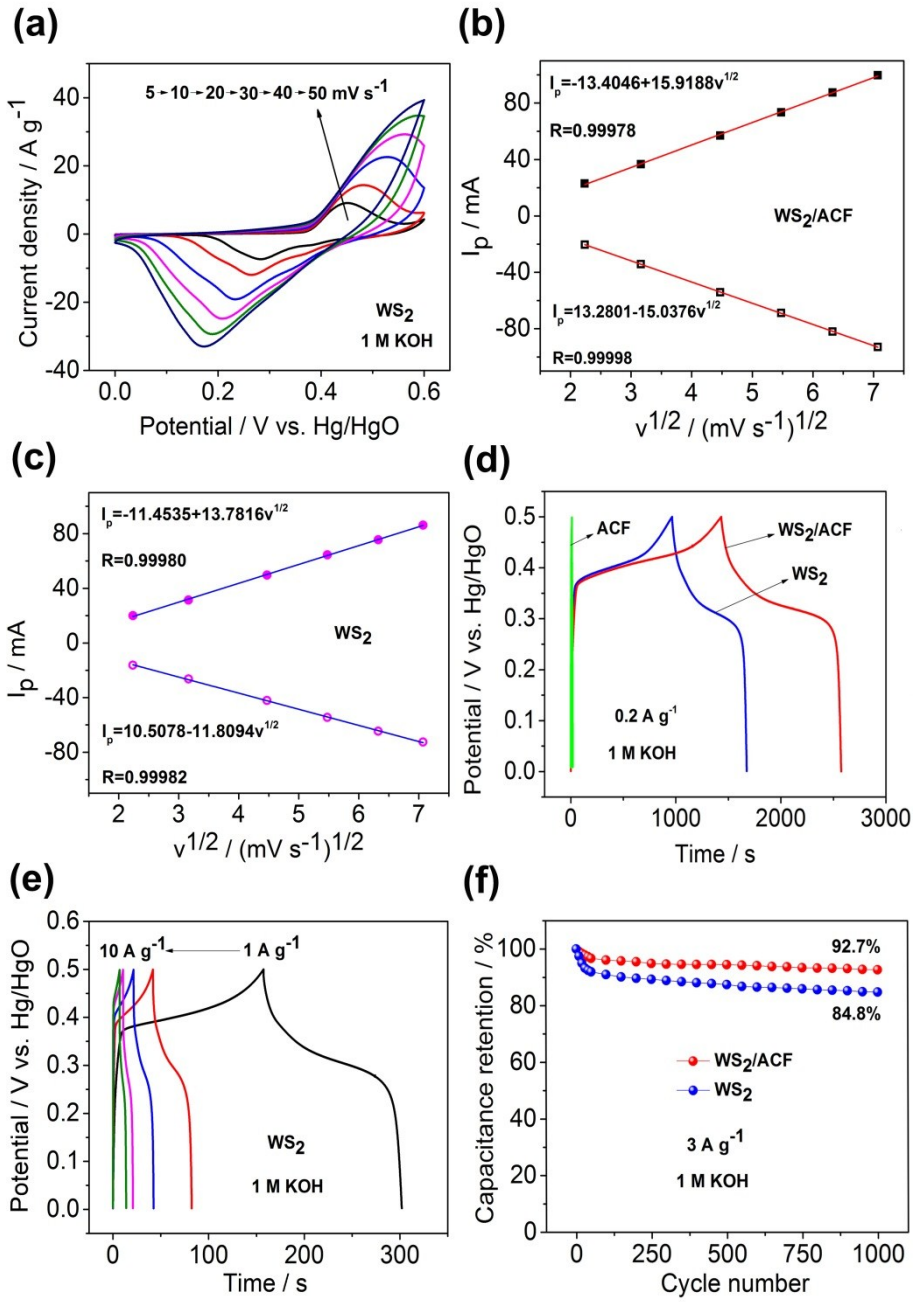

Fig. S3 CV curves of pure WS_2 at different scan rates (a), plots of the current at different scan rates (b and c), galvanostatic charge-discharge curves of ACF, WS_2, and WS_2/ACF at 0.2 A g^{-1} (d), galvanostatic charge-discharge curves of WS_2 at different current densities (e), cyclic performance of WS_2 and WS_2/ACF at 3 A g^{-1} in 1 mol L^{-1} KOH (f).

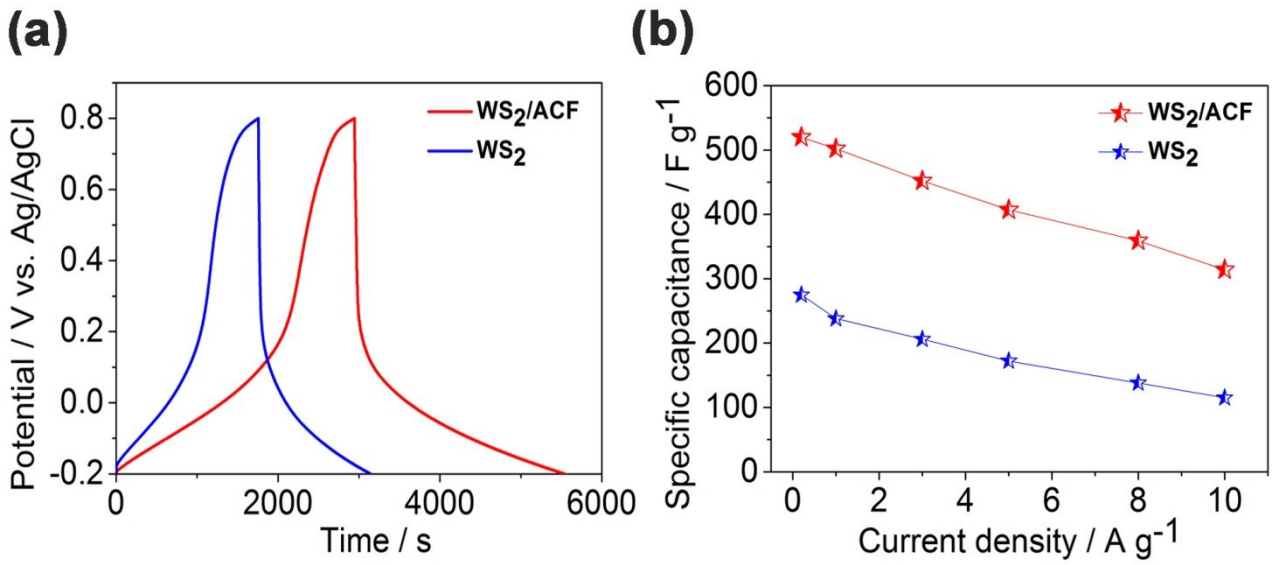

Fig. S4 (c) galvanostatic charge-discharge curves of pure WS_2 and WS_2/ACF at 0.2 A g^{-1}, (d) rate performance cuvers of pure WS_2 and WS_2/ACF.

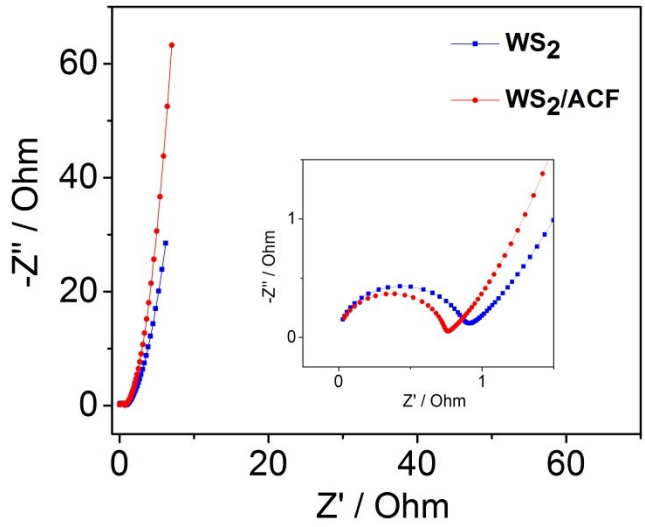

Fig. S5 EIS curves of WS_2/ACF and WS_2 in 1 mol L^{-1} KOH.

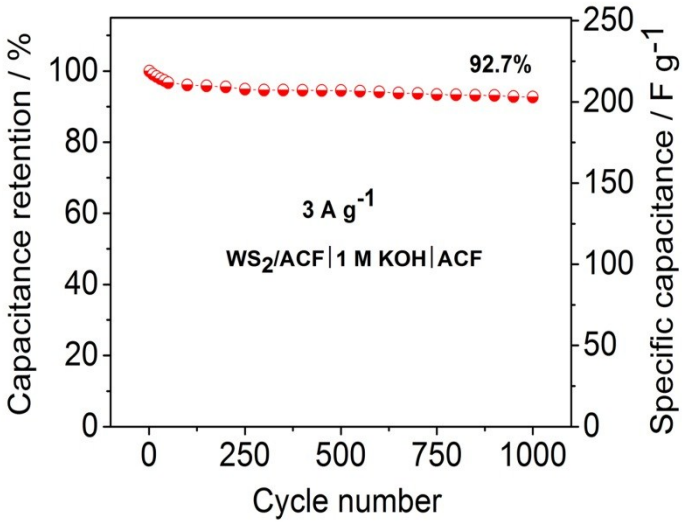

Fig. S6 The capacity retention during galvanostatic charge-discharge cycling of the WS_2/ACF//ACF at 3 A g^{-1} in 1 mol L^{-1} KOH.

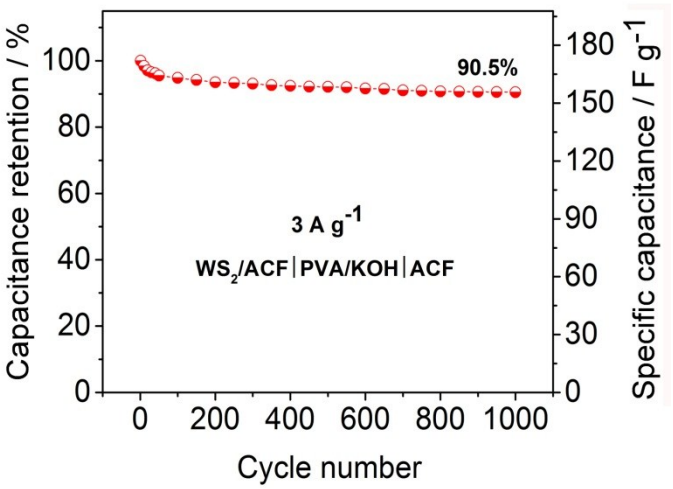

Fig. S7 The capacity retention during galvanostatic charge-discharge cycling of the WS_2/ACF//ACF at 3 A g^{-1} in PVA/KOH.

Table S1 Specific capacitance of metal sulfide based composite

	Materials	Current density ($A\ g^{-1}$)	Capacitance ($F\ g^{-1}$)	Electrolyte	Reference
1	PPy/MoS_2	1	553.7	1 mol L^{-1} KCl	1
2	MoS_2/graphene nanosheets	2	320	1 mol L^{-1} Na_2SO_4	2
3	s-MoS_2/carbon nanospheres	0.5	231	1 mol L^{-1} Na_2SO_4	3
4	MoS_2/N-doped graphene	0.25	245	1 mol L^{-1} KOH	4
5	Porous tubular C/MoS_2	1	210	3 mol L^{-1} Na_2SO_4	5
6	3D graphene/MoS_2	1	410	1 mol L^{-1} Na_2SO_4	6
7	WS_2	0.5	34	Phosphate buffer solution (pH 7.4)	7
8	WS_2-PANI	0.2	382	2 mol L^{-1} H_2SO_4	8
9	WS_2/RGO	0.5	350	1 mol L^{-1} H_2SO_4	9
10	WS_2/ACF	1	502	1 mol L^{-1} H_2SO_4	This work
11	WS_2/ACF	1	600	1 mol L^{-1} KOH	This work

References

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