

Supporting Information

Prussian blue-derived synthesis of uniform nanoflakes- assembled NiS₂ hierarchical microspheres as highly efficient electrocatalysts in dye-sensitized solar cells

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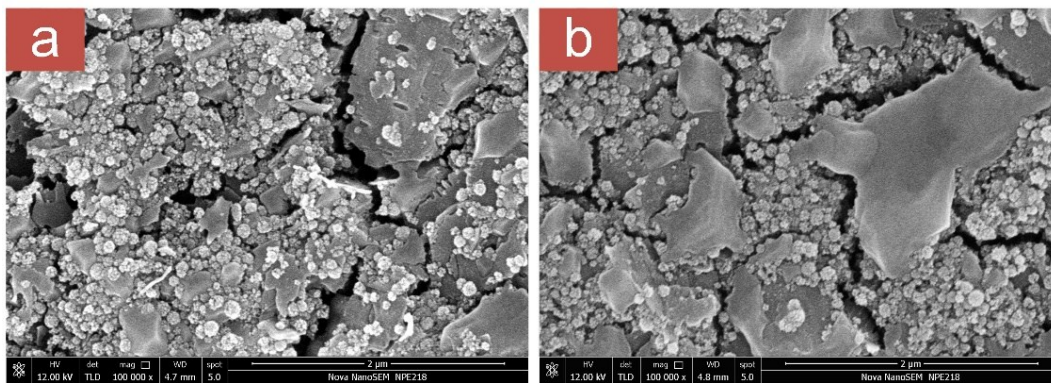


Fig. S1 SEM images of the as-obtained products with $\text{Ni}(\text{NO}_3)_2$ and $\text{Ni}(\text{CH}_3\text{COO})_2$ as nickel source.

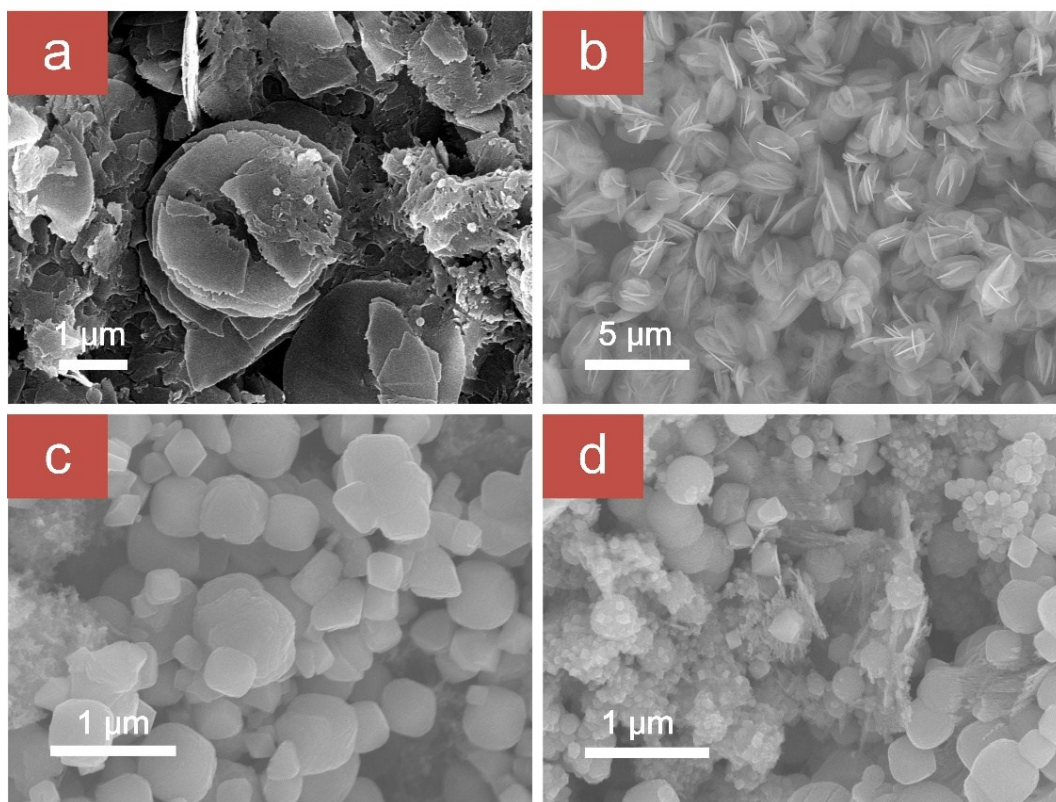


Fig. S2 SEM images of the as-obtained products with different reaction temperature: (a) 60°C; (b) 100°C; (c) 140°C and (d) 180°C.

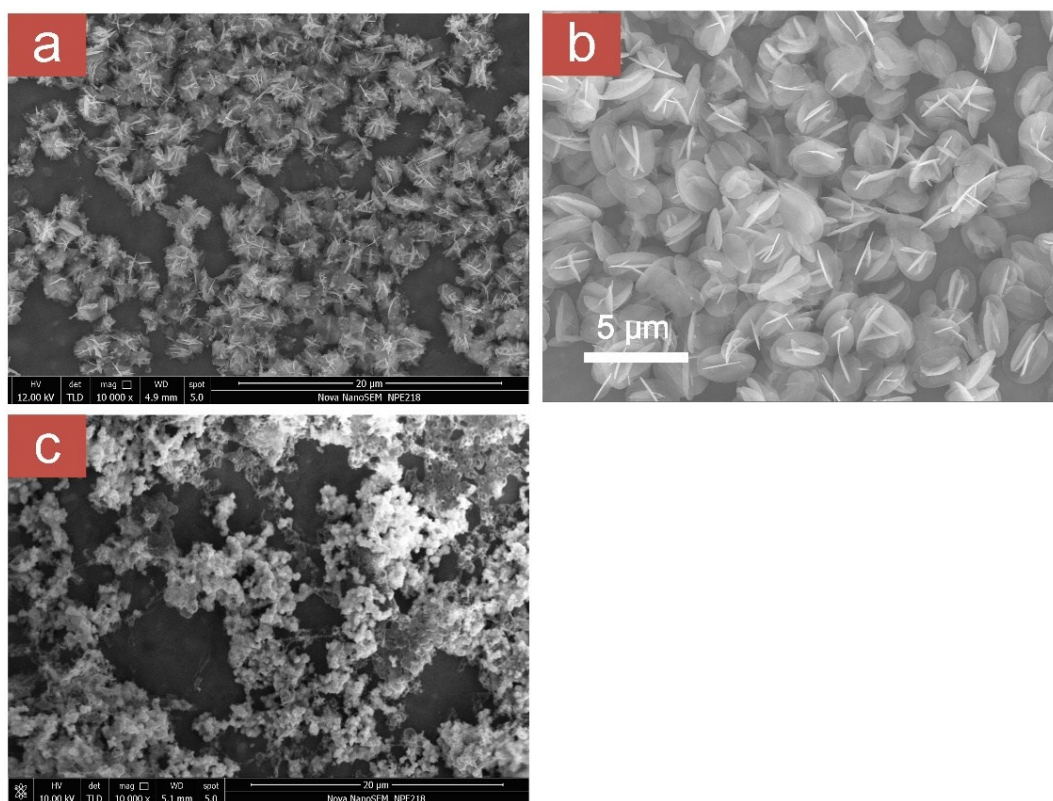


Fig. S3 SEM images of the as-obtained products with different reaction solvent: (a) 30 mL ethanol + 60 mL water; (b) 60 mL ethanol + 30 mL water; (c) pure water.

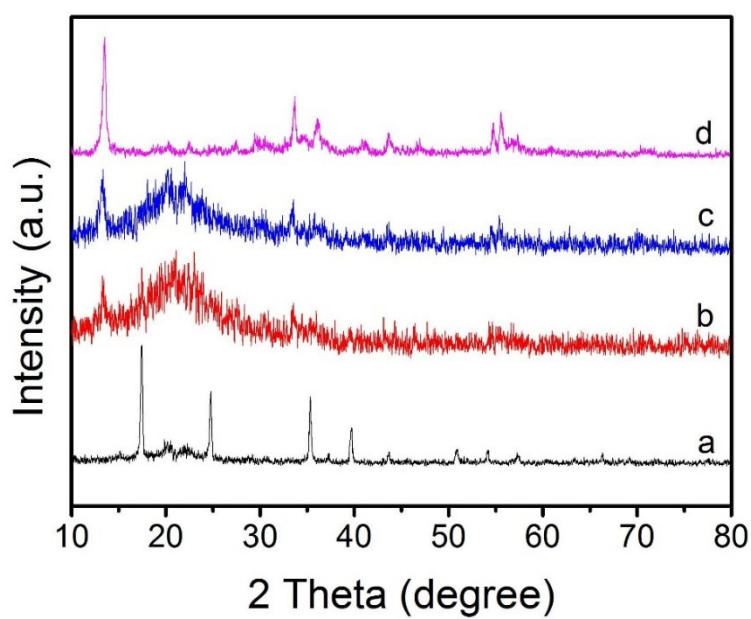


Fig. S4 XRD pattern of the as-obtained samples with different reaction time: (a) 0.5 hour; (b) 1.0 hour; (c) 1.5 hour and (d) 10 hour.

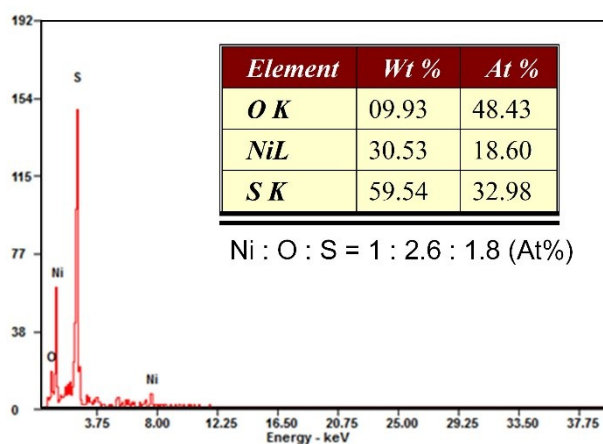


Fig. S5 EDX spectra of the as-obtained products after reaction for 1.5 h.

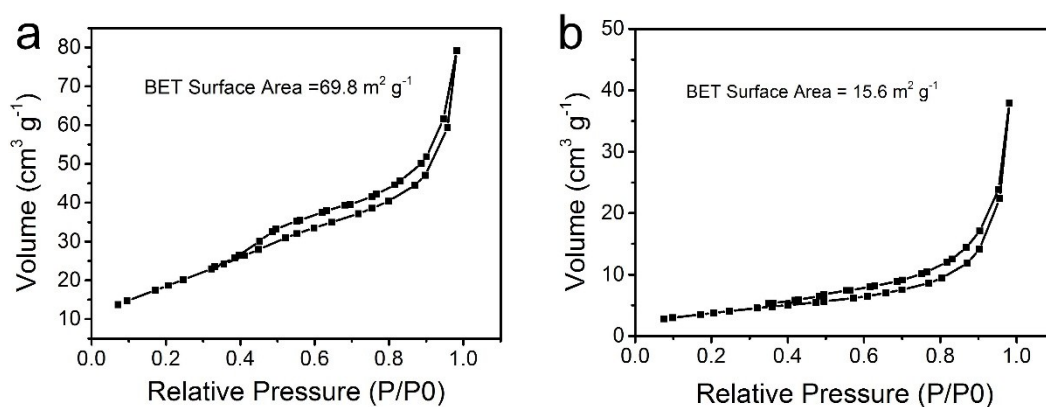


Fig. S6 Nitrogen adsorption/desorption isotherms of the as-synthesized 3D hierarchical NiS₂ microspheres (a) and irregular NiS₂ nanoparticles (b).

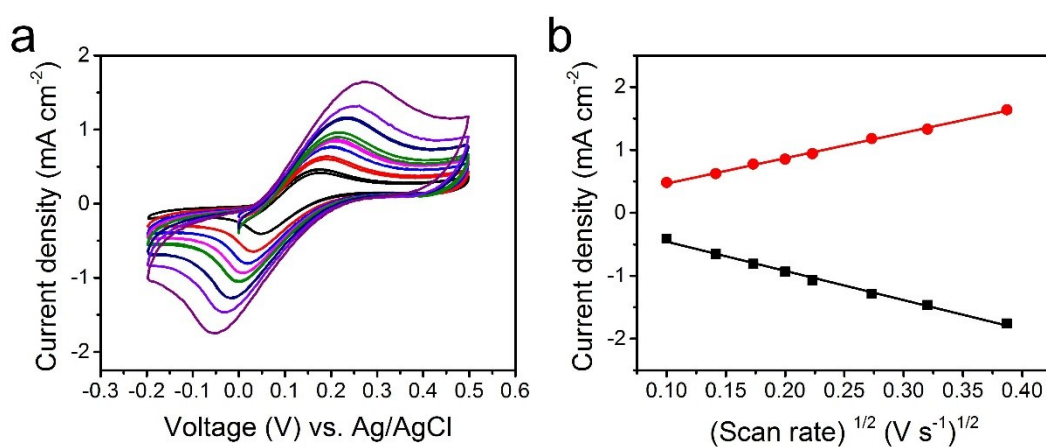


Fig. S7 CV curves of the NiS₂ NSs CE at different scan rate; (b) the relationship between the peak current density and the square root of scanning rate of NiS₂ NSs CEs.

Tab S1. Photovoltaic performances of DSSCs with different CEs under AM1.5G illumination.

CEs	Number	V _{oc} [mV]	J _{sc} [mA/cm ²]	FF	η [%]
NiS ₂ MSs	1#	746	16.23	0.70	8.48
	2#	762	15.93	0.71	8.62
	3#	749	16.27	0.70	8.53
	4#	744	16.32	0.69	8.38
	5#	740	16.29	0.70	8.44
	6#	748	16.07	0.69	8.29
	Average	745	16.28	0.70	8.46
	SD	3.775	0.038	0.005	0.063
NiS ₂ NPs	1#	747	15.29	0.68	7.76
	2#	745	15.22	0.68	7.71
	3#	738	15.36	0.70	7.94
	4#	742	15.27	0.69	7.82
	5#	748	15.13	0.67	7.58
	6#	746	15.28	0.68	7.75
	Average	745	15.27	0.68	7.76
	SD	2.161	0.031	0.004	0.040
Pt	1#	741	15.75	0.69	8.05
	2#	735	15.51	0.70	7.98
	3#	744	15.76	0.69	8.09
	4#	747	15.56	0.70	8.14
	5#	737	15.52	0.68	7.89
	6#	742	15.64	0.69	8.03
	Average	741	15.66	0.70	8.04
	SD	3.873	0.116	0.005	0.046

The average value of PCE is determined by ignoring one largest and one smallest value.

SD: standard deviation

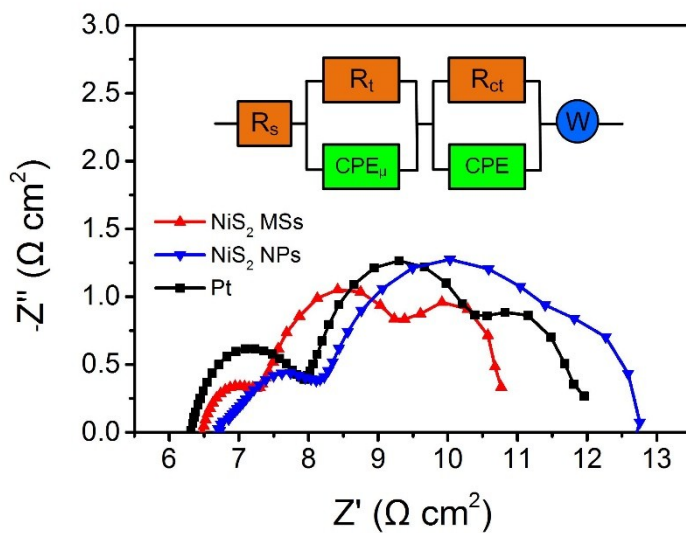


Fig. S8 Nyquist plots of complete DSSCs under illumination of 100 mW cm^{-2} with a bias voltage of V_{oc} . The inset shows the relevant equivalent circuit mode by the Zview software.

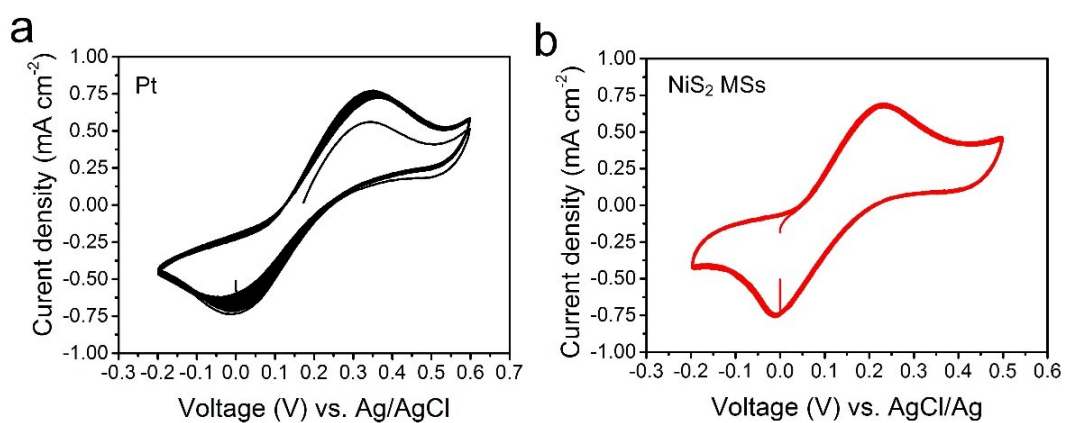


Fig. S9 100 consecutive CVs of NiS_2 NSs CE with a scan rate of 50 mV s^{-1} in 10 mM LiI , 1 mM I_2 , and 0.1 M LiClO_4 acetonitrile.

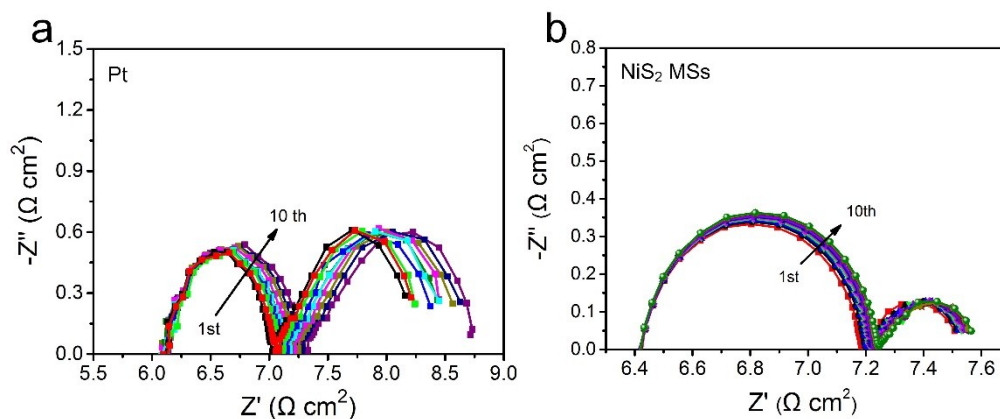


Fig. S10 Nyquist plots of EIS for the symmetrical cells with Pt (a) and (b) NiS₂ MSs CEs. The cell was first subjected to CV scanning from 0 to 1 V and then from -1 to 0 V with a scan rate of 100 mV s⁻¹, followed by 60 s relaxation at 0 V, and then EIS measurement at 0 V from 0.1 Hz to 1 M Hz was performed. This sequential electrochemical test was repeated for 10 times.