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Supporting Information

Nickel silicotungstate decorated Pt photocathode as efficient catalyst for triiodide reduction in dye-sensitized solar cells

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Synthesis of $SiW_{11}Ni$

6.4 g of $K_8SiW_{11}O_{39}$ was dissolved in 30 mL of water, the solution was maintained at 40 °C, added 4 mL $NiSO_4$ (0.5 mol·L^{-1}) solution to the above solution. The salt was precipitated with 2 g of potassium chloride, filtered and dissolved again in hot water. The potassium salt was crystallized by cooling.

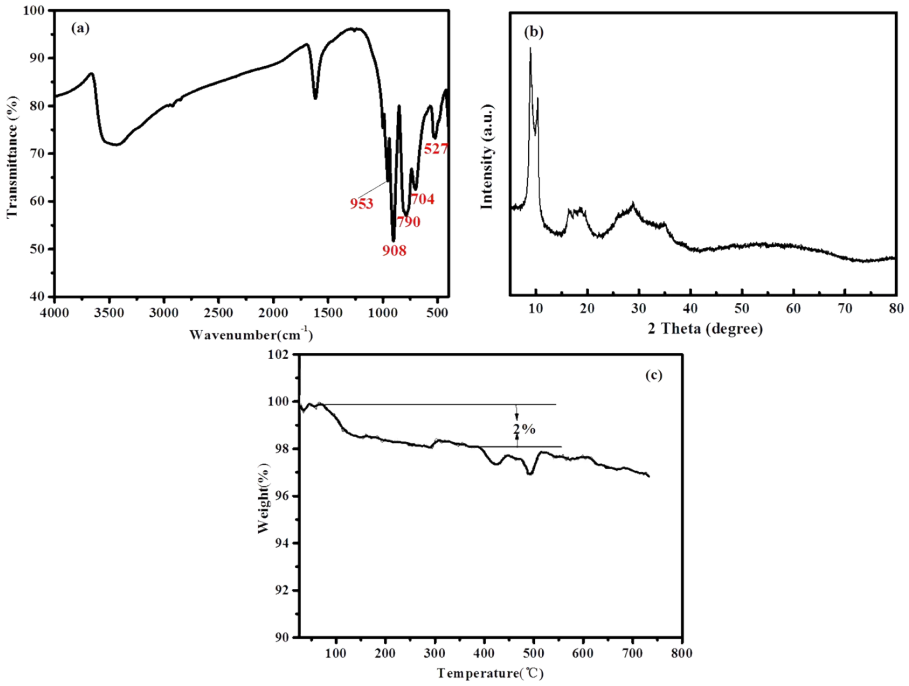

Fig. S1 FT-IR spectrum of $SiW_{11}Ni$ (a), XRD (b) and TG spectrum of $SiW_{11}Ni$ (c).

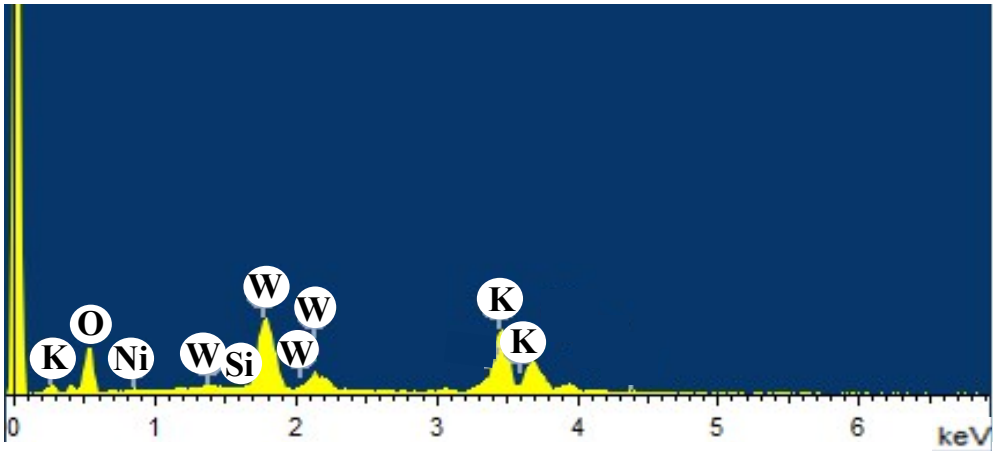

Fig. S2 EDS analysis of the elemental composition for $SiW_{11}Ni$.

Table S1. The element distribution of the $SiW_{11}Ni$ compound.

Element	Weight %	Atom %
K K	7.13	10.86
Si K	0.95	1.36
W M	68.48	18.45
O K	21.82	67.60
Ni K	1.63	1.73
Total	100.00	

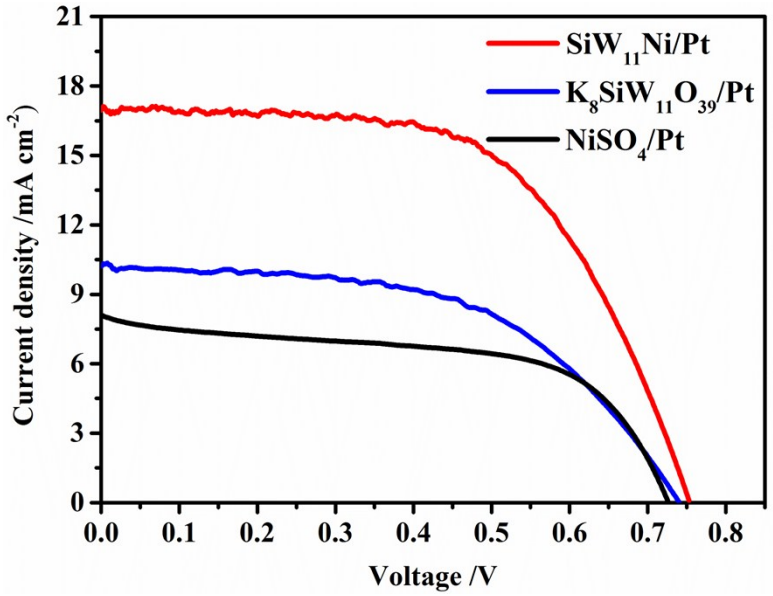

Fig. S3 Photocurrent-voltage curves of DSSCs based on $SiW_{11}Ni$/Pt, $NiSO_4$/Pt and $K_8SiW_{11}O_{39}$/Pt different counter electrodes.

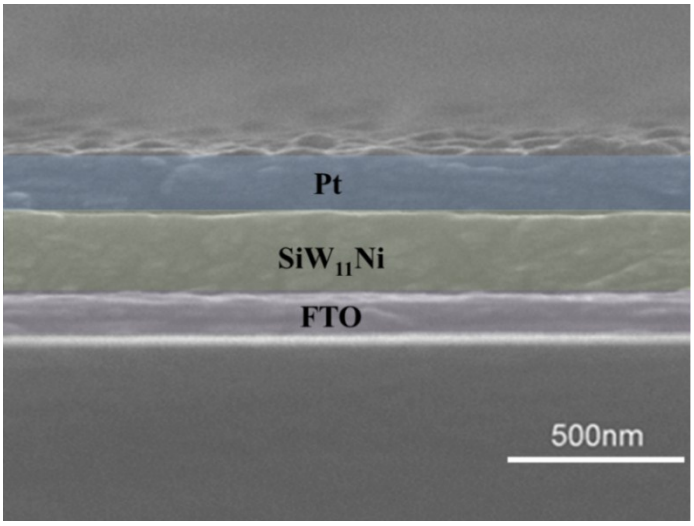

Fig. S4 The cross section SEM image of $SiW_{11}Ni$/Pt counter electrode.

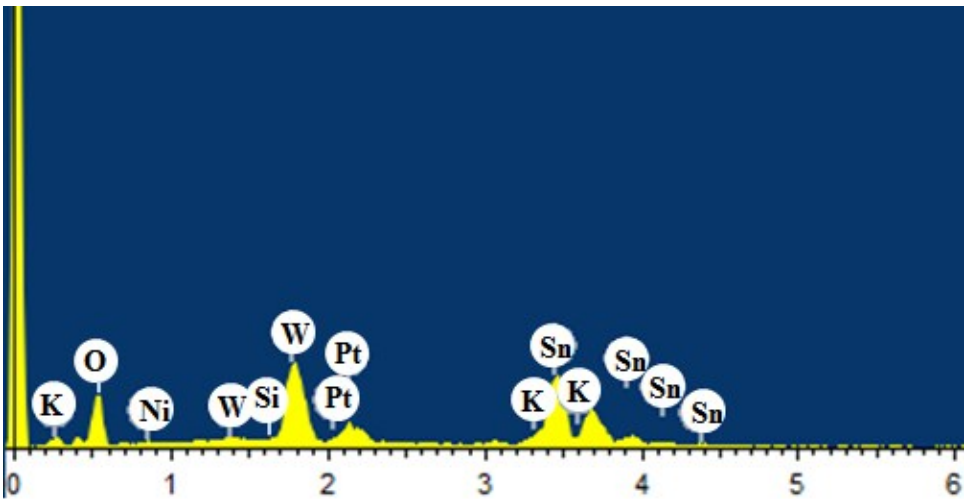

Fig. S5 The EDS spectra of the $SiW_{11}Ni$/Pt counter electrode.

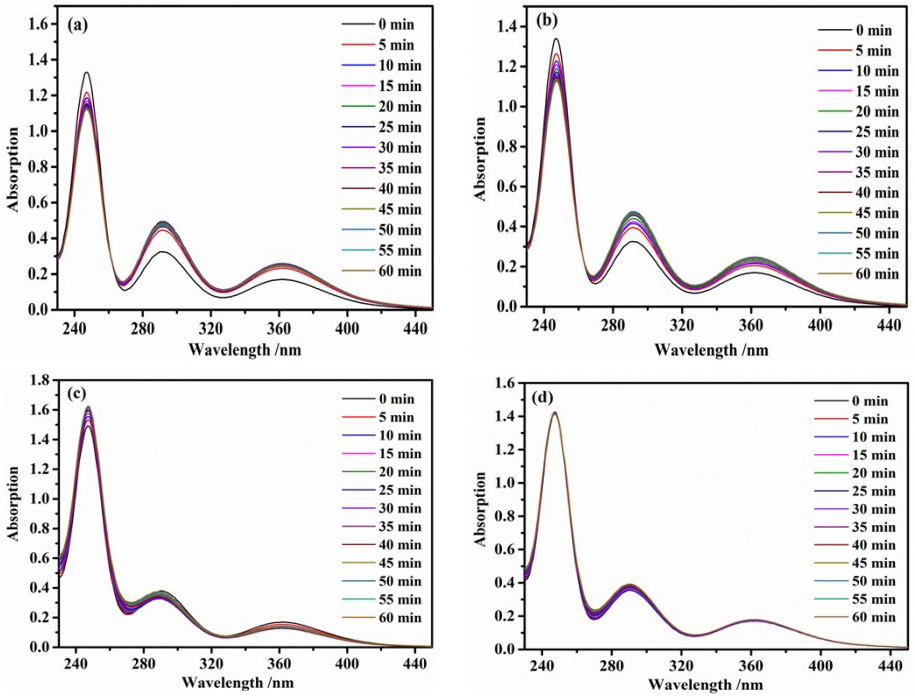

Fig. S6 UV–vis spectra of the electrolyte (a), traditional Pt (b), $SiW_{11}Ni$ (c) and $SiW_{11}Ni$/Pt (d); the LiI concentration was ～10 mM.

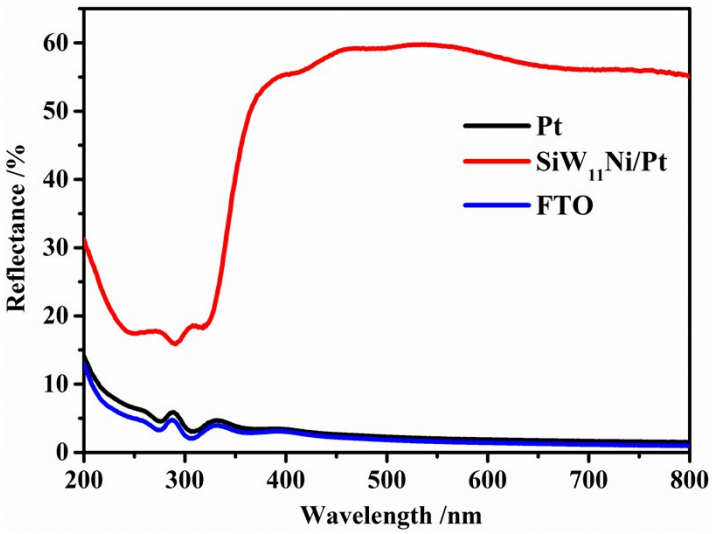

Fig. S7 The reflection spectra of FTO conductive glass, $SiW_{11}Ni/Pt$ and Pt films.