Electronic Supplementary Material (ESI) for RSC Advances.
This journal is © The Royal Society of Chemistry 2017

Electronic Supplementary Information

Table S1. Comparison of photoelectrochemical performances of WO_3 photoanodes with oxygen vacancies.

Morphology	**Preparation method**	**Treatment**	**Photocurrent (mA/cm^2) at 1.23 V vs. RHE**	**Onset potential (V vs. RHE)**	**Light source**	**Ref**
Nanoflake	Seed-mediated solvothermal growth on FTO	Hydrogen annealing at 350 °C for 20 mins	0.65	0.8	100 W Xe lamp	29
Nanoflake	Hydrothermal growth on FTO	Chemical reduction using PVP	1.1	0.75	300 W Xe lamp	5
Particles	Drop casting of particles synthesized via sol-gel on ITO	Annealing in air at 400 °C for 1 h	0.9	0.6	300 W Xe lamp	a
Coarse grains	Annealing RF sputtered W in air at 500 °C for 5 h	Hydrogen plasma	0.4	0.6	150 W Xe lamp	b
Mesoporous	Drop casting and annealing	Treatment with Li-EDA (lithium dissolved in ethylenediamine)	2.75	0.6	100 $mWcm^{-2}$ simulated sunlight	c
Nanowire	Flame Vapor Deposition (FVD)	Using CH_4 gas as reducing agent	0.8	0.9	100 $mWcm^{-2}$	d
Plate-like	Acid-mediated hydrothermal treatment	Calcination in air	1.06	0.75	300 W Xe lamp	Current work

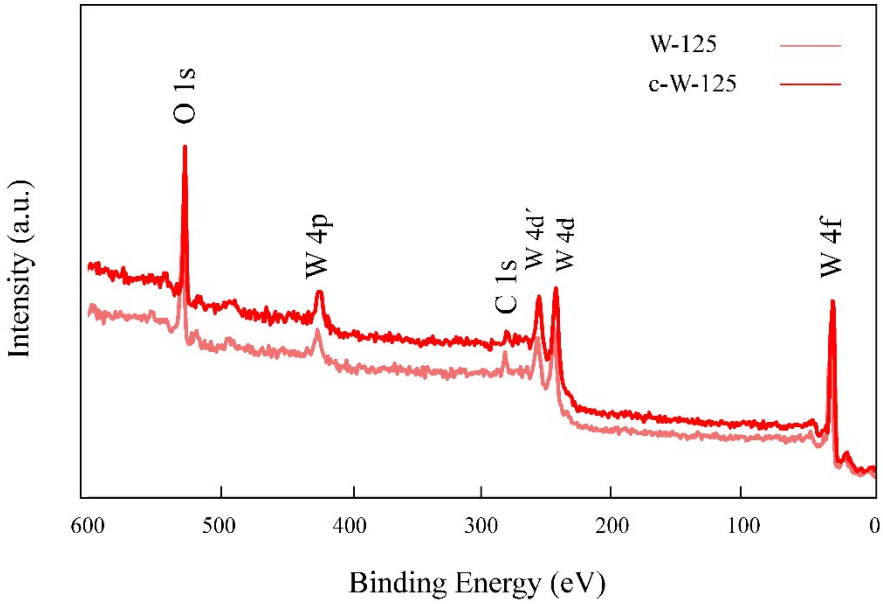

Figure S1. Wide scan X-ray photoelectron spectroscopy of samples W-125 and c-W-125.

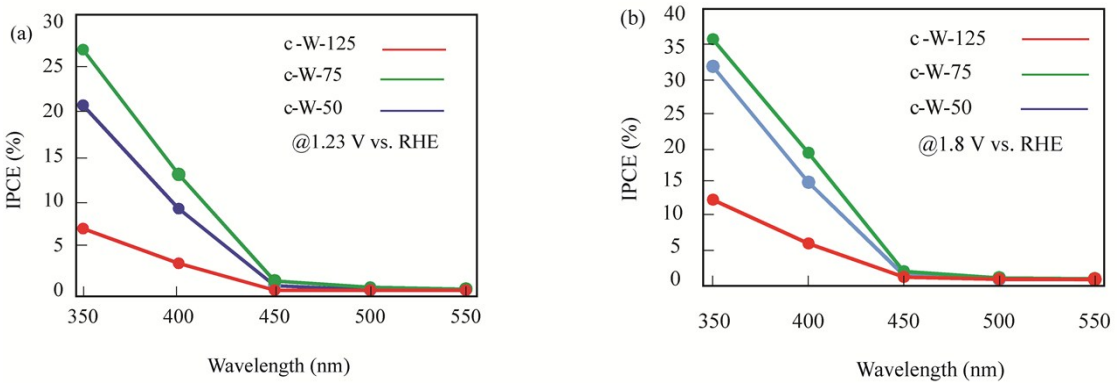

Figure S2. IPCE measurement results for c-W-50 and c-W-75 samples at (a) 1.23 V vs. RHE and (b) 1.8 V vs. RHE in 0.5 M Na_2SO_4 (pH 5.9).

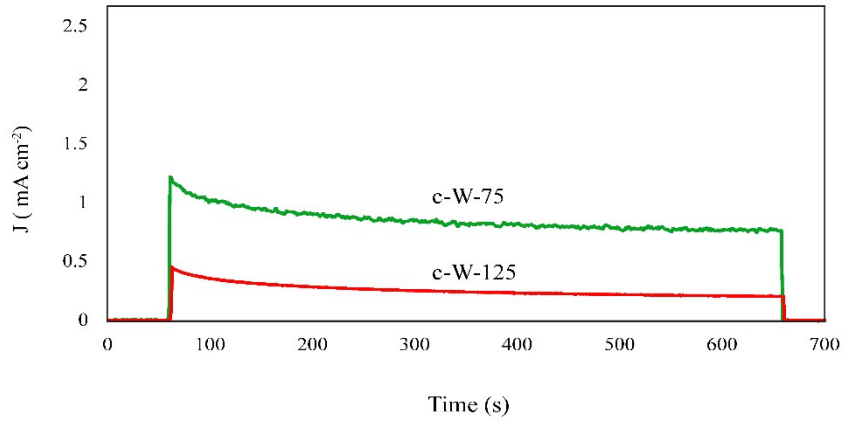

Figure S3. Steady-state photocurrent of calcinated samples prepared by acid-mediated hydrothermal treatment in 75 ˚C and 125 ˚C under applied potential of 1.5 V vs. RHE in 0.5 M Na_2SO_4. Illumination source was 500 W xenon lamp (285 mW/cm^2).

References

a. N. Naseri, Journal of alloys and compounds, 2017, **693**, 871.

b. T. Singh, R. Müller, J. Singh and S. Mathur, *Applied Surface Science*, 2015, **347**, 448.

c. M. Ma, K. Zhang, P. Li, M. S. Jung, M. J. Jeong and J. H. Park, *Angew. Chem*, 2016, **128**, 1.

d. P. M. Rao, I. D. Cho and X. Zheng, *Proceedings of the Combustion Institute*, 2013, **34(2)**, 2187.