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## Supporting information



**Fig. S1** FE-SEM images of as-prepared precursor ZnSn(OH)<sub>6</sub>samples synthesized with different NaOH moles: (a, b) 60 mmol, (c, d) 66mmol, (e, f) 72 mmol, (g, h) 78 mmol.



Fig. S2 SEM images of cross-section image of photoanodes of Zn<sub>2</sub>SnO<sub>4</sub>/SnO<sub>2</sub>.



**Fig. S3** Impedance spectra of DSSCs based on ZS, AZS0, AZS1, AZS2, AZS3 and AZS4 photoanodes measured under forward bias in dark.