# Supporting Information for:

# Photoelectrochemical Water Oxidation by Screen-Printed ZnO Nanoparticle Films: Effect of pH on Catalytic Activity and Stability

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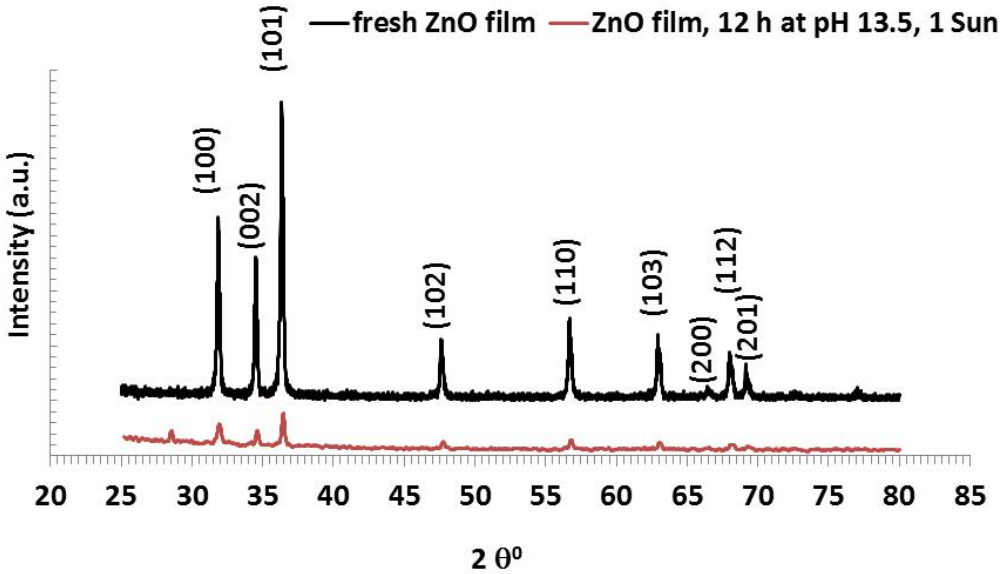


**Figure S1.** XRD pattern of a fresh ZnO film and after 12 hours of CPE at 120 mV overpotential at pH 13.5 (under 1 Sun illumination). Marked peaks match the crystal planes of wurtzite.

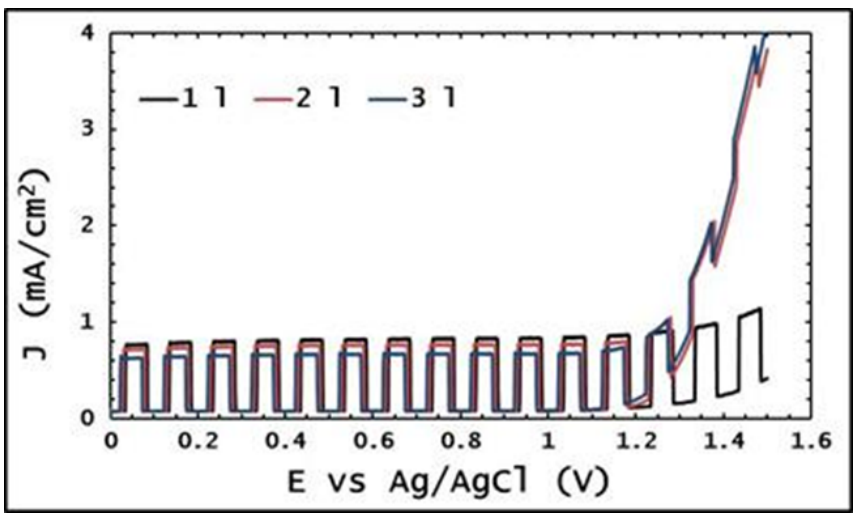


**Figure S2.** Initial LSV testing of the 1-,2- and 3- layer screen-printed ZnO films (in a 0.6M $Na_2SO_4$ solution, 0-1.5 V *vs.* Ag/AgCl at a 5 mV/s scan rate. )

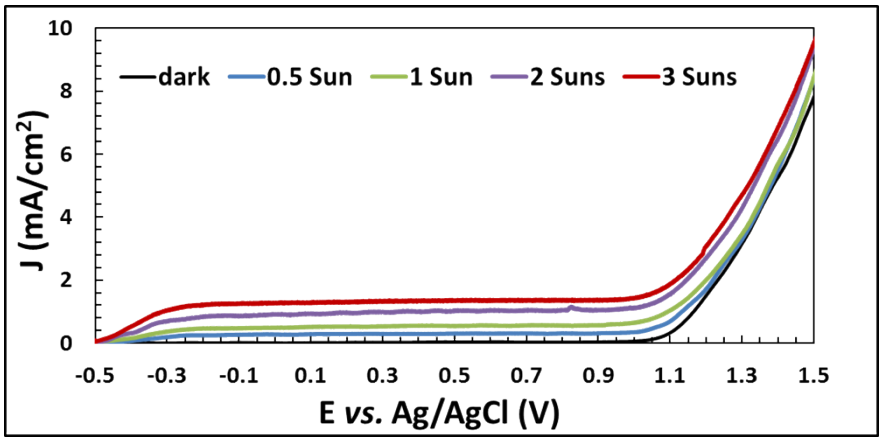


**Figure S3.** Dependence of photocurrent on light intensity (at pH=10.5, in a borate buffer).

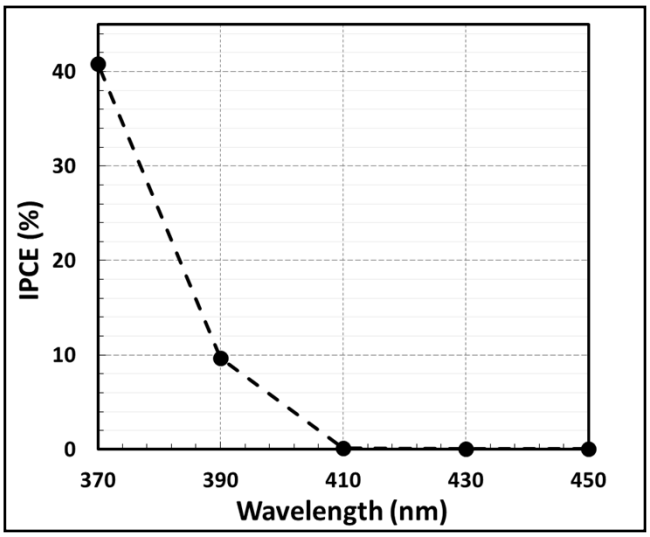


**Figure S4.** IPCE of the screen-printed ZnO films (in a pH 10.5 borate buffer).

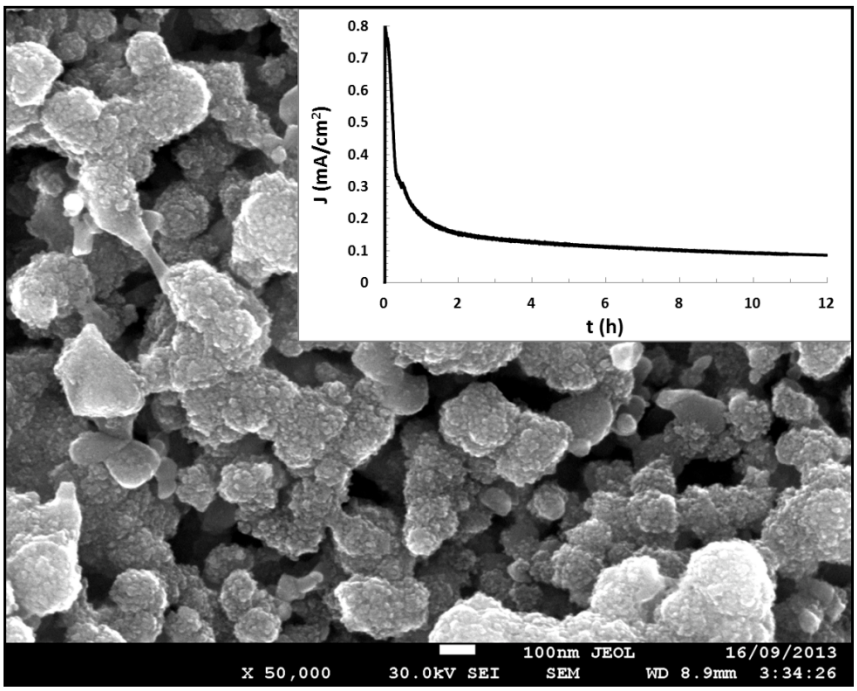


**Figure S5.** SEM image of a ZnO film after CPE at pH 12 (η=120 mV, 12 h, in a 0.6 M pH 12 $NaClO_4$/NaOH electrolyte, under 1 Sun.) The inset shows the J-t curve during the CPE experiment.

**Table S1.** ICP-TOF-MS analysis of the Zn-content of films (after 12 hours of operation at 1 Sun) and corresponding electrolytes (pH 10.5 borate buffer).

| Sample | Amount of Zn in the used film (μg) | Amount of Zn in the electrolyte (μg) | Total amount of Zn (μg) | Leached Zn-ions (%) |
|---|---|---|---|---|
| -0.2 V | 3.102 | 0.363 | 3.46 | 10.5 |
| 0 V | 3.427 | 0.243 | 3.67 | 6.6 |
| 0.66 V | 3.566 | 0.603 | 4.16 | 14.5 |