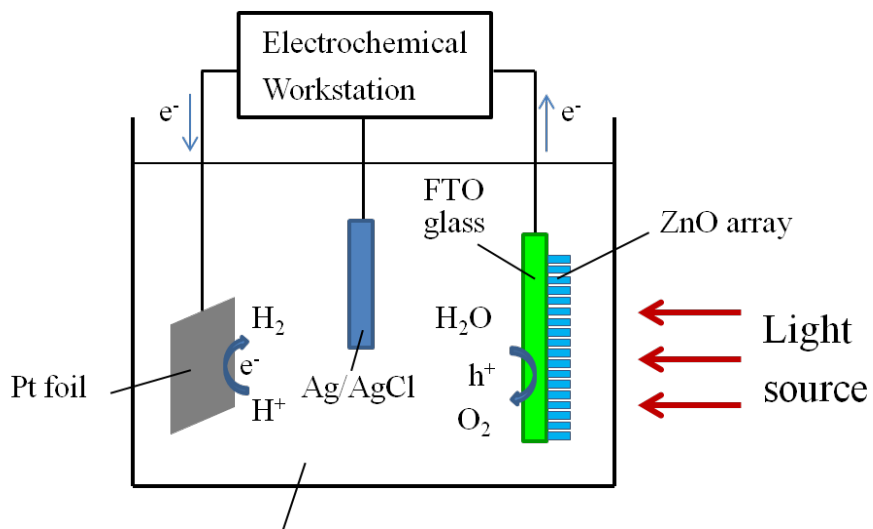


Au Nanoparticles Sensitized ZnO Nanopencil Arrays for Photoelectrochemical Water Splitting

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Electrolyte: $0.5\text{ M Na}_2\text{SO}_4$

Fig. S1. Illustrative schematic of PEC measurements.

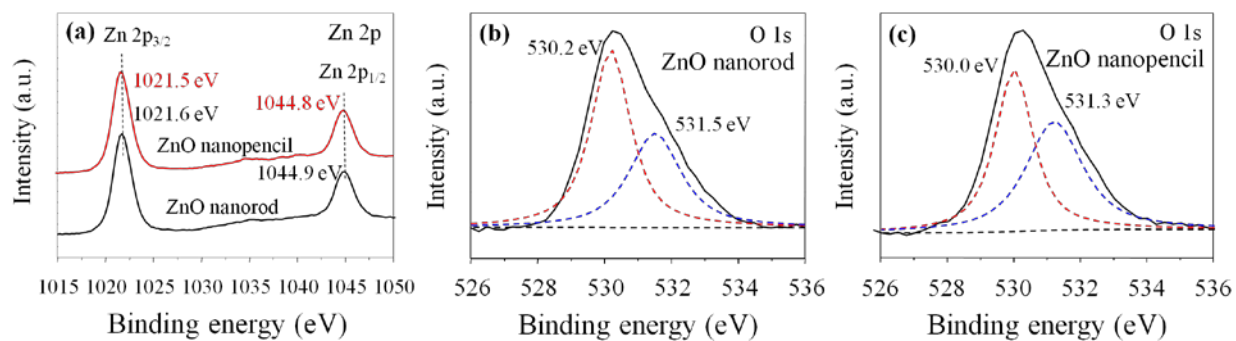


Fig. S2. (a) Zn 2p XPS spectra of ZnO nanorod and nanopencil arrays. (b) O 1s XPS spectra of ZnO nanorod arrays and (c) ZnO nanopencil arrays.

Table S1. XPS data of oxygen species on the surface of ZnO nanorod and ZnO nanopencil array.

Samples	B.E.* of O in crystal lattice (eV)	B.E. of oxygen vacancy (eV)	The percent of O in crystal lattice# (%)	The percent of oxygen vacancy# (%)
ZnO nanorods	530.2	531.5	60.2	39.8
ZnO nanopencils	520.0	531.3	51.0	49.0

* B.E.: Binding energy.

The percentage of O in crystal lattice and oxygen vacancy is determined by integrating the peak areas in **Fig. S2 (b)** and **(c)**.