

Supplementary Materials: Original Approach to Synthesize TiO₂/ZnO Hybrid Nanosponges Used as Photoanodes for Photoelectrochemical Applications

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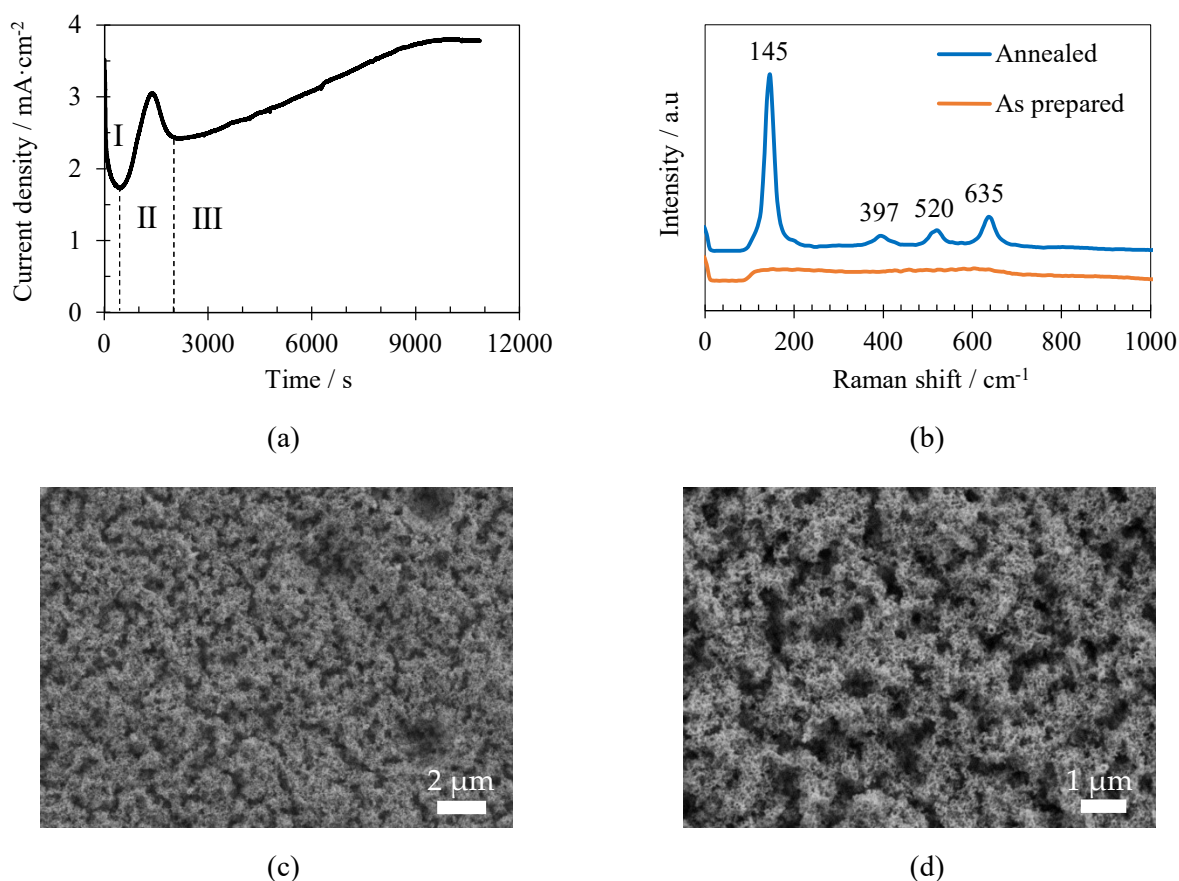


Figure S1. (a) Current density versus time during anodization of Ti in 0.27 M NH₄F containing glycerol/water (60:40 vol. %) at 30 V for 3 h. (b) Raman spectra of TiO₂ nanosponges before and after the heat treatment at 450 °C for 1 h. FE-SEM images of the annealed TiO₂ nanosponges at (c) 5000 X, and (d) 15000 X.

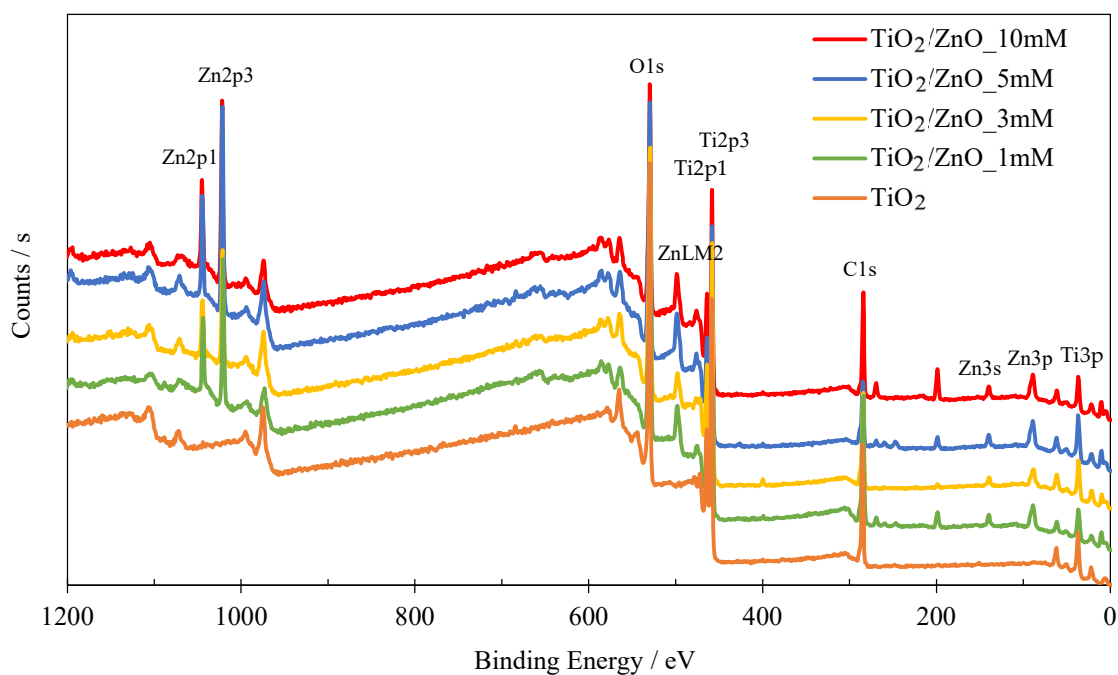


Figure S2. XPS spectra of TiO₂ nanosponges and TiO₂/ZnO hybrid nanosponges electrodeposited on crystalline TiO₂ for 15 minutes at 75 °C with different Zn(NO₃)₂ concentrations.

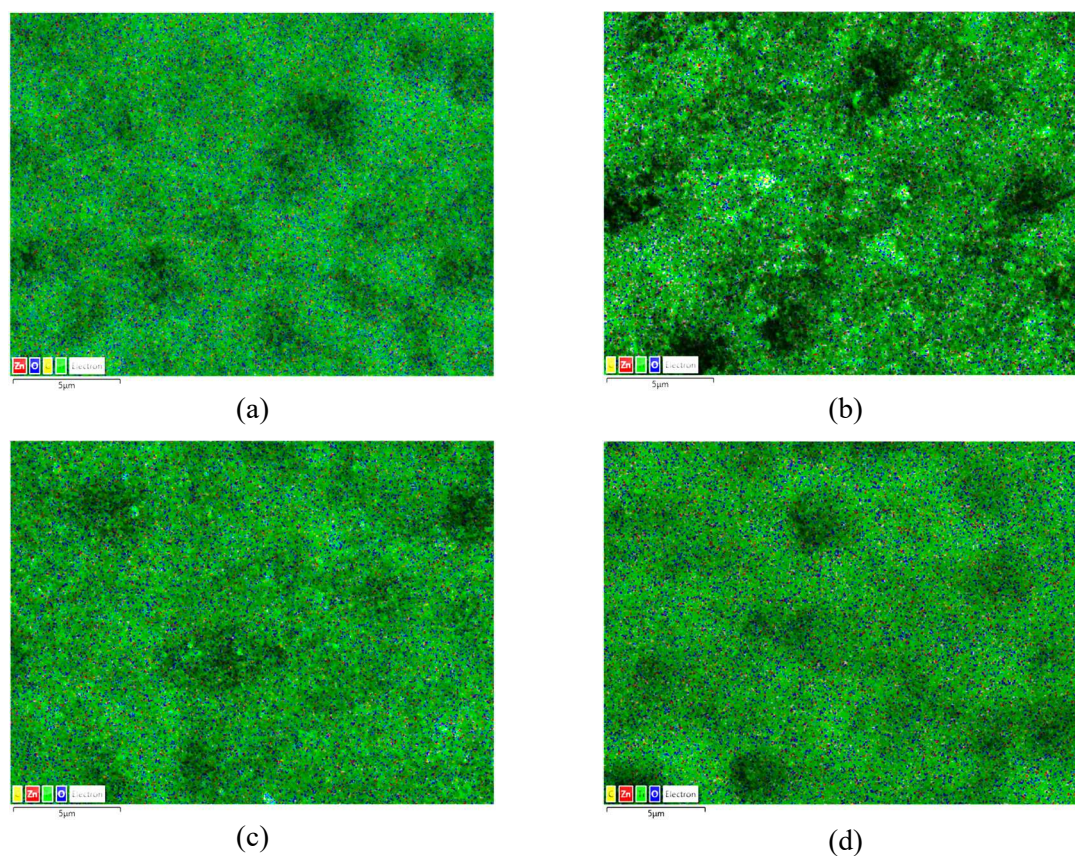


Figure S3. EDX mapping of TiO₂/ZnO hybrid nanosponges electrodeposited for 15 min at 75 °C with Zn(NO₃)₂ concentration of (a) 1, (b) 3, (c) 5, and (d) 10 mM.

Table S1. Current density at 0.6 V_{Ag/AgCl} under illuminated conditions (i_{\max}), increase in current density at 0.6 V_{Ag/AgCl} between dark and light conditions (Δi), and percentage improvement in current density at 0.6 V_{Ag/AgCl} under illumination (%_{improvement}) with respect to the TiO₂ nanosponges, for TiO₂/ZnO hybrid nanosponges electrodeposited on amorphous TiO₂ at 25 °C with 1 mM Zn(NO₃)₂.

Time (min)	i_{\max} (mA·cm ⁻²)	Δi (mA·cm ⁻²)	% _{improvement}
15	0.029	0.028	-48.21
30	0.024	0.023	-57.14
60	0.014	0.012	-75.00

Table S2. Analysis of variance for density current (mA·cm⁻²) of the individual factors of Zn(NO₃)₂ concentrations and temperature, the interaction between them, and their quadratic effects.

	Sum of squares	Gl	Mean square	F _{ratio}	p-Value
Zn(NO ₃) ₂	0.00016737	1	0.00016737	9.28	0.0057
Temperature	0.00197606	1	0.00197606	109.55	0.0000
Zn(NO ₃) ₂ ²	5.88984E-7	1	5.88984E-7	0.03	0.8582
Zn(NO ₃) ₂ ·T	2.58574E-7	1	2.58574E-7	0.01	0.9057
Temperature ²	0.0000449854	1	0.0000449854	2.49	0.1279
Residual error	0.000414857	23	0.0000180372		
Total	0.00264598	29			

Statistically significant factor when p-Value is lower to 0.05.