

Supporting Information

ZnO rods rooted on manifold carbon nanofiber paper as scalable photocatalyst
platform: *Effects of ZnO morphology*

Sung-Ho Hwang,^a Young Kwang Kim,^a Song Hyun Yoon,^a

Sang Kyoo Lim,^{a,*} and Hyunwoong Park^{b,*}

^a*Division of Nano & Energy Convergence Research, Daegu Gyeongbuk Institute of Science
and Technology (DGIST), Daegu 42988, Republic of Korea*

^b*School of Energy Engineering, Kyungpook National University, Daegu 41566, Republic of
Korea*

*To whom correspondence should be addressed:

(S.K. Lim) limsk@dgist.ac.kr; (H. Park) hwp@knu.ac.kr

Table S1. Adsorption of phenol in CNF/ZnO samples. The samples (~4.6 mg) were immersed in aqueous phenol solution (200 μ M; 50 mL) for 30 min prior to irradiation.

Samples	CZ-a-0.25	CZ-a-0.5	CZ-0.25	CZ-0.5
Adsorption amount (μ mol/g)	53.2	51.5	54.9	54.5
Adsorption capacity (%)	2.45	2.37	2.53	2.51

Table S2. Charge transfer resistance (R_{ct}) of the samples.

Samples	CZ-a-0.25	CZ-a-0.5	CZ-0.25	CZ-0.5	NP
R_{ct} (Ω)	57.07	81.83	143.1	113.9	278.1

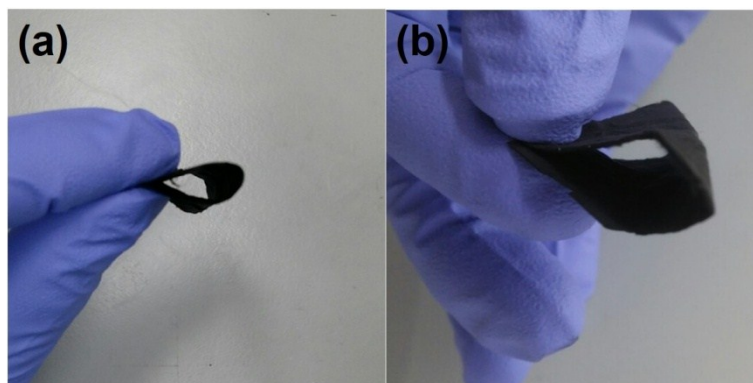


Fig. S1. Photographs of (a) an as-synthesized CNF film and (b) a CNF manifold film (fold five times). Both were annealed at 1400 °C.

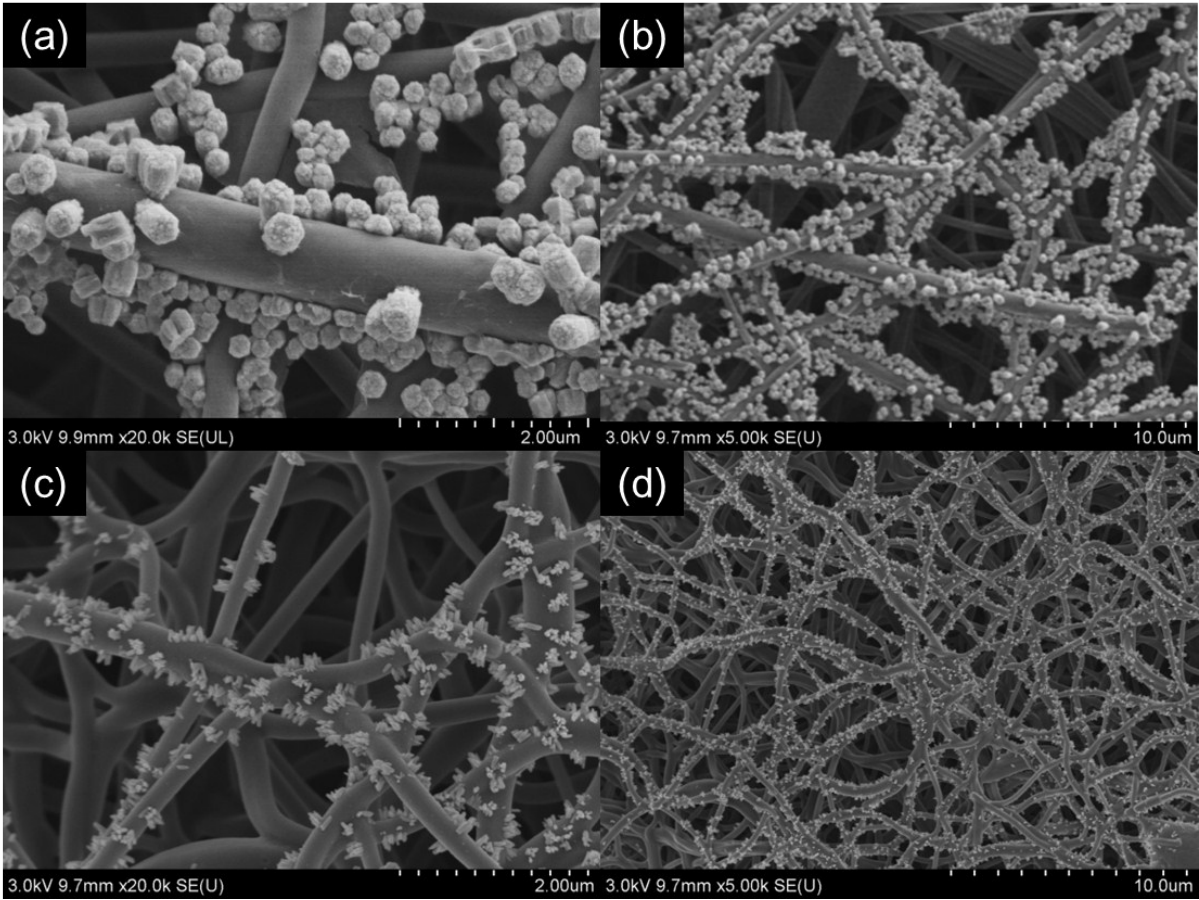


Fig. S2. SEM images of (a, b) CZ-0.5 and (c, d) CZ-0.25. They were synthesized via the electrodeposition of ZnO on carbon nanofibers-woven webs placed in the aqueous solutions of zinc acetate at 0.5 and 0.25 mM, respectively.

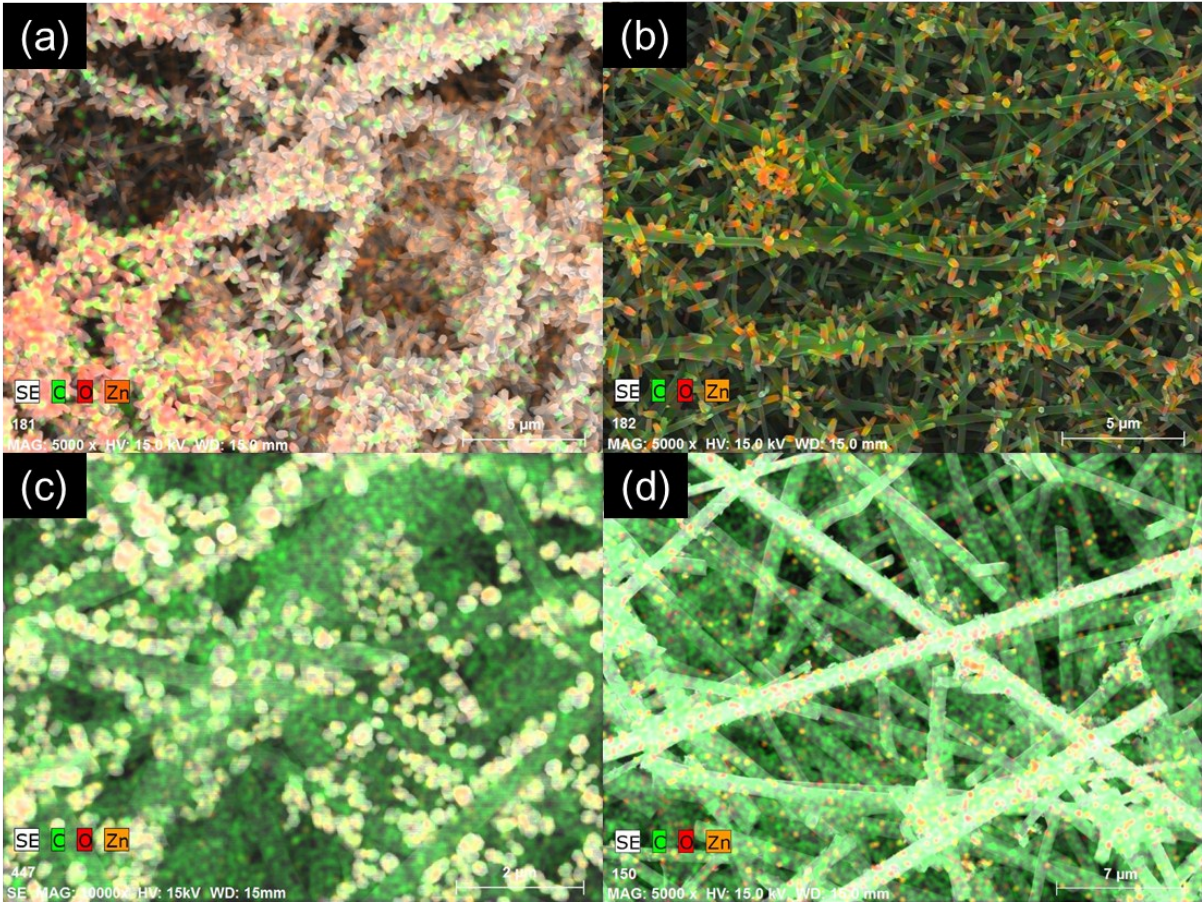


Fig. S3. EDX mapping of (a) CZ-a-0.5 and (b) CZ-a-0.25 (c) CZ-0.5 and (d) CZ-0.25.

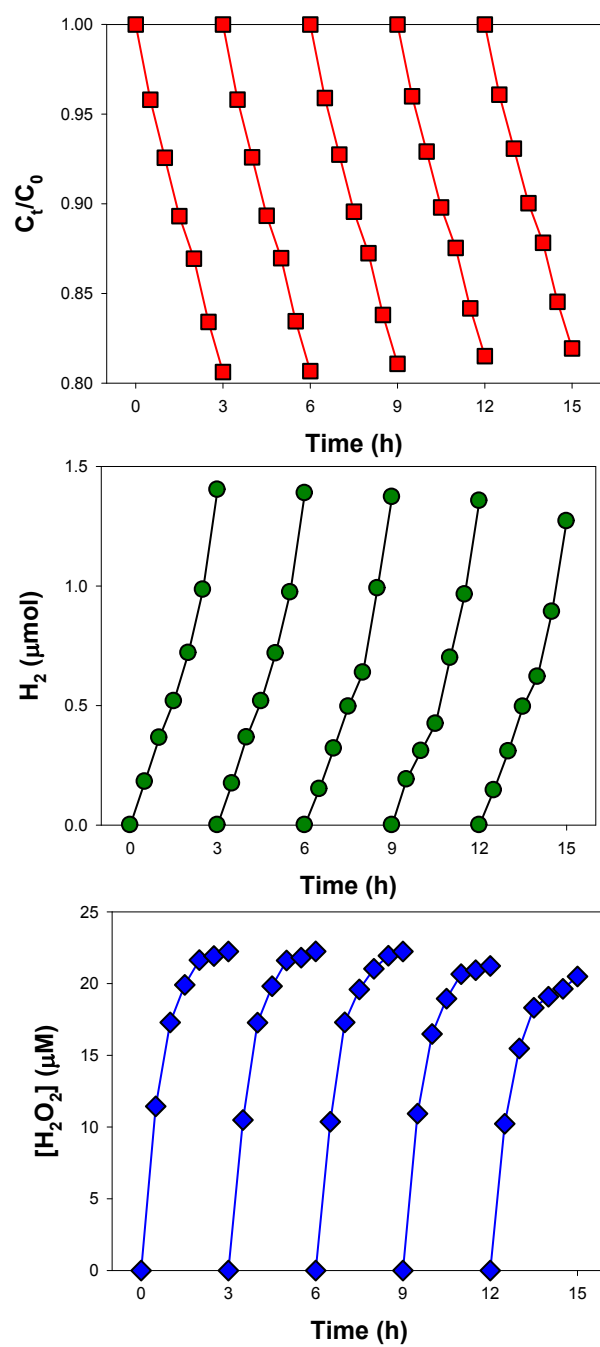


Fig. S4. Reusability tests of CZ-a-0.25 sample for phenol (PhOH, 200 μM) degradation, and H_2 and H_2O_2 productions.

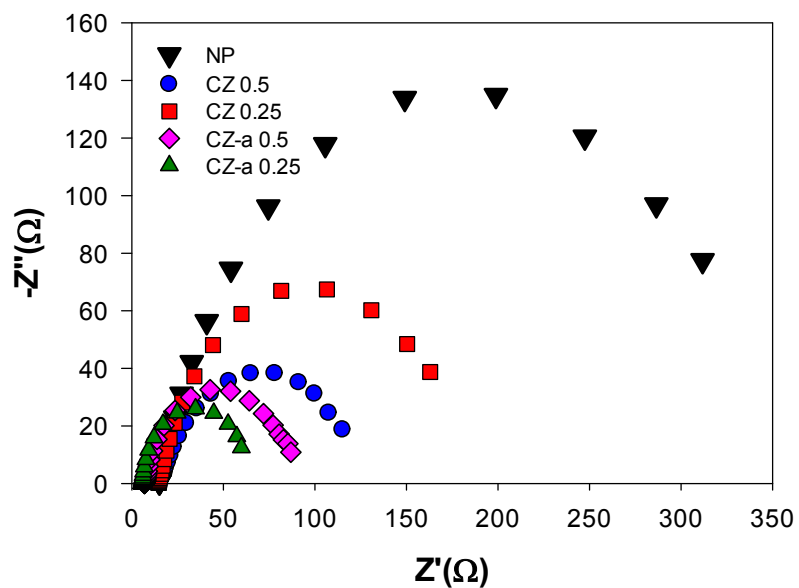


Fig. S5. EIS analysis of the samples. They were held at a bias potential of -0.2 V vs. Ag/AgCl in 1 M KOH solution with a frequency range of 100 kHz to 0.1 Hz with an AC perturbation of 5 mV.

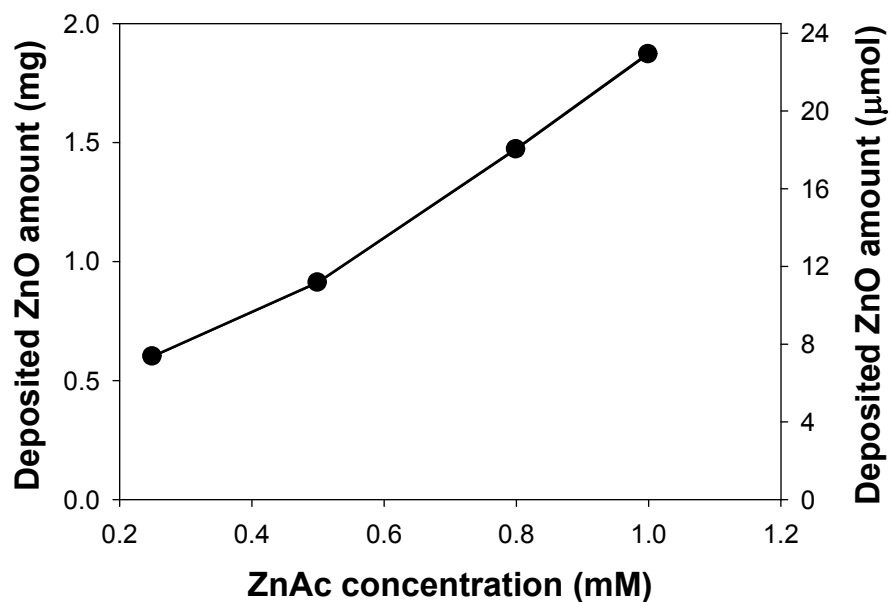


Fig. S6. Effect of ZnAc concentration on the amount of ZnO loaded in CNF.

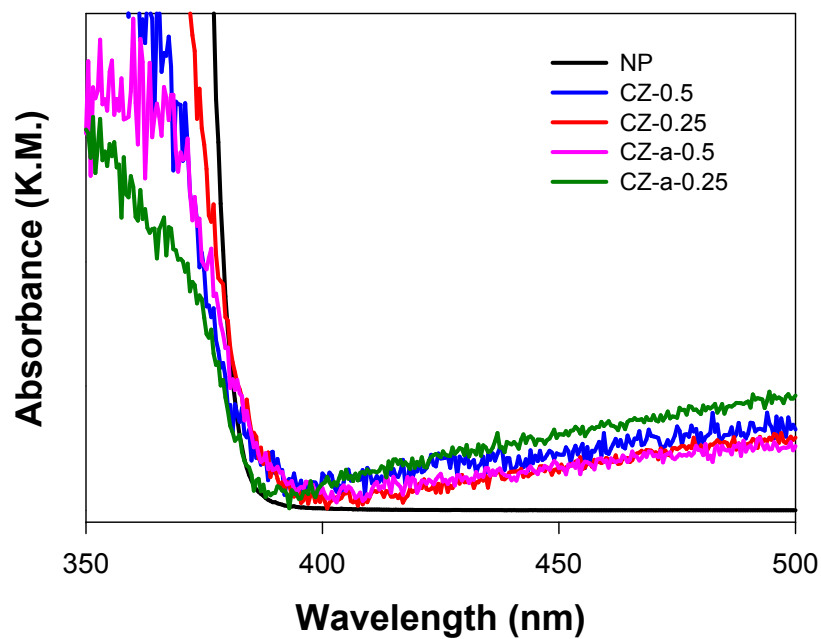


Fig. S7. UV-vis diffuse reflectance absorption spectra of samples. The absorbance was expressed as a Kubelka-Munk unit.

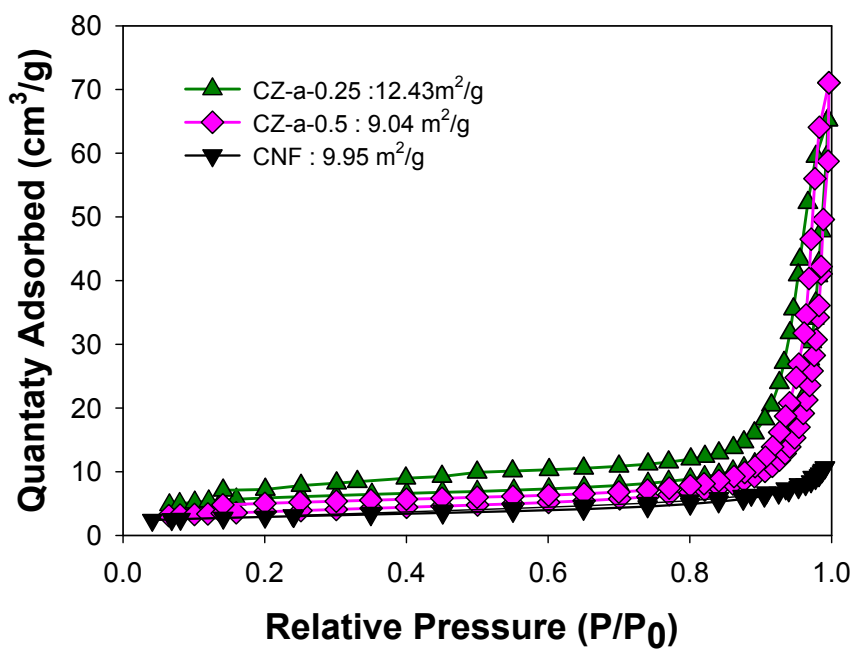


Fig. S8. N₂ adsorption-desorption BET isotherms of CZ-a-0.25, CZ-a-0.5, and CNF.