

## SUPPLEMENTARY MATERIALS

# Environmentally Friendly Fabrication of High-Efficient Fe-ZnO/Citric Acid-Modified Cellulose Composite and the Enhancement of Photocatalytic Activity in the Presence of H<sub>2</sub>O<sub>2</sub>

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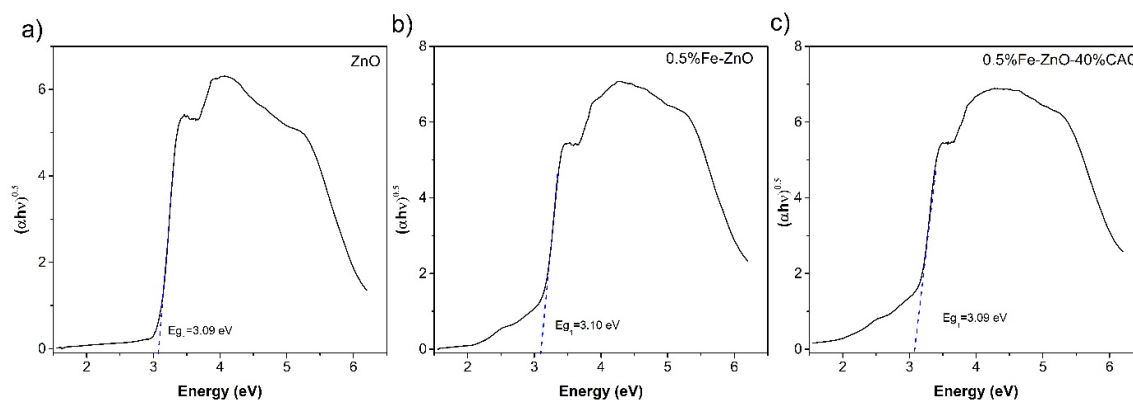
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**Abstract:** In the present study, a novel Fe-ZnO/citric acid-modified cellulose composite

**Table S1.** Examples of a current study of the photocatalytic IBU in degradation in the presence of different materials.

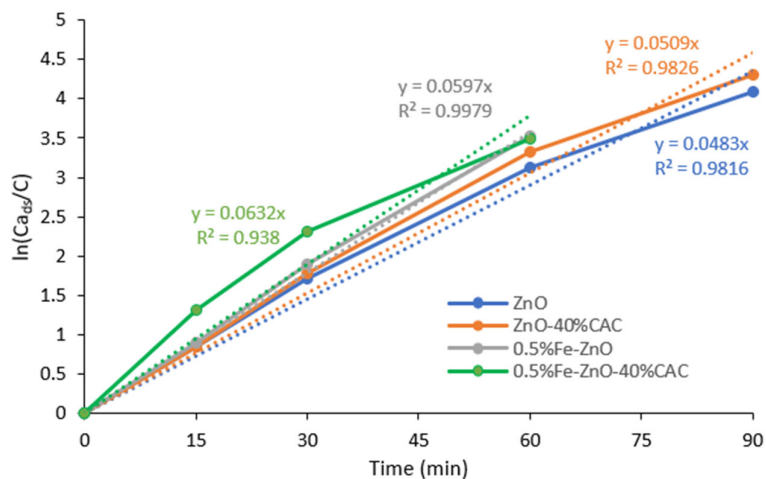
No.	Photocatalyst	Type of Light Used	Condition Set			Degradation	Ref.
			Catalyst Loading	Initial Concentration	Reaction Time		
1.	TiO <sub>2</sub> Degussa P25	10 W UV high intensity LEDs	0.5, 1.0 or 1.5 g · dm <sup>-3</sup>	60 mg · dm <sup>-3</sup>	90 min	100% (for 0.5 g · dm <sup>-3</sup> catalyst loading)	[41]
2.	Commercial TiO <sub>2</sub> solid (Vetec, average particle size of 100 nm).	mercury lamp (125 W)	0.1, 0.3, and 0.5 g · dm <sup>-3</sup>	10 <sup>-4</sup> M	120 min	100% after 10 minutes (for 0.5 g · dm <sup>-3</sup> catalyst loading)	[42]
3.	ZnO-Ce	mercury lamp (125 W)	0.5, 1.0, and 1.5 g · dm <sup>-3</sup>	20 mg · dm <sup>-3</sup>	120 min	60% (for 0.5 g · dm <sup>-3</sup> catalyst loading)	[43]
4.	ZnO	125 W medium pressure Hg vapor lamp (UV-C)	0.5 g · dm <sup>-3</sup>	1.5-13 mg · dm <sup>-3</sup>	100min	80% at 10 mg · dm <sup>-3</sup> initial concentration	[40]
5.	BiOCl (99.8%; Alfa Aesar)	Rayonet-RPR 100 UV Photoreactor equipped with four 254-nm 128 W · m <sup>-1</sup> two-prong bulbs	0.25 g · dm <sup>-3</sup>	20 mg · dm <sup>-3</sup>	120 min	20 min	[44]
6.	α-Fe <sub>2</sub> O <sub>3</sub> /rGO	white LED	5 g · dm <sup>-3</sup>	5 mg · dm <sup>-3</sup>	140 min	100%	[45]
7.	PVDF- ZnO/Ag <sub>2</sub> CO <sub>3</sub> /Ag <sub>2</sub> O membrane	(LED) lamp, λ = 420 nm, 100 W	Ultrafiltration by ZnO/Ag <sub>2</sub> CO <sub>3</sub> /Ag <sub>2</sub> O nanocomposite incorporated the poly (vinylidene fluoride)membrane	20 mg · dm <sup>-3</sup>	60 min	35.3%	[46]



**Figure S1.** Tauc plot of (a) ZnO, (b) 0.5%Fe-ZnO and (c) 0.5%Fe-ZnO-40%CAC.

**Table S2.** Electrical energy per order for IBU degradation in the presence of selected photocatalysts during photocatalytic process and supported with H<sub>2</sub>O<sub>2</sub>.

Photocatalyst	EE/O for Photocatalysis (Wh · dm <sup>-3</sup> /Order)	EE/O for Photocatalysis+H <sub>2</sub> O <sub>2</sub> (Wh · dm <sup>-3</sup> /Order)
ZnO	0.564	0.581
0.5%Fe-ZnO	0.541	0.387
ZnO-40%CAC	0.567	0.448
0.5%Fe-ZnO-40%CAC	0.429	0.220



**Figure S2.** Trend of first-order linearized equation used for the calculation of kinetic parameters of selected photocatalytic processes.

## References

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