

Supplementary Materials

UV-Light-Driven Enhancement of Peroxidase-Like Activity of Mg-Aminoclay-Based $\text{Fe}_3\text{O}_4/\text{TiO}_2$ Hybrids for Colorimetric Detection of Phenolic Compounds

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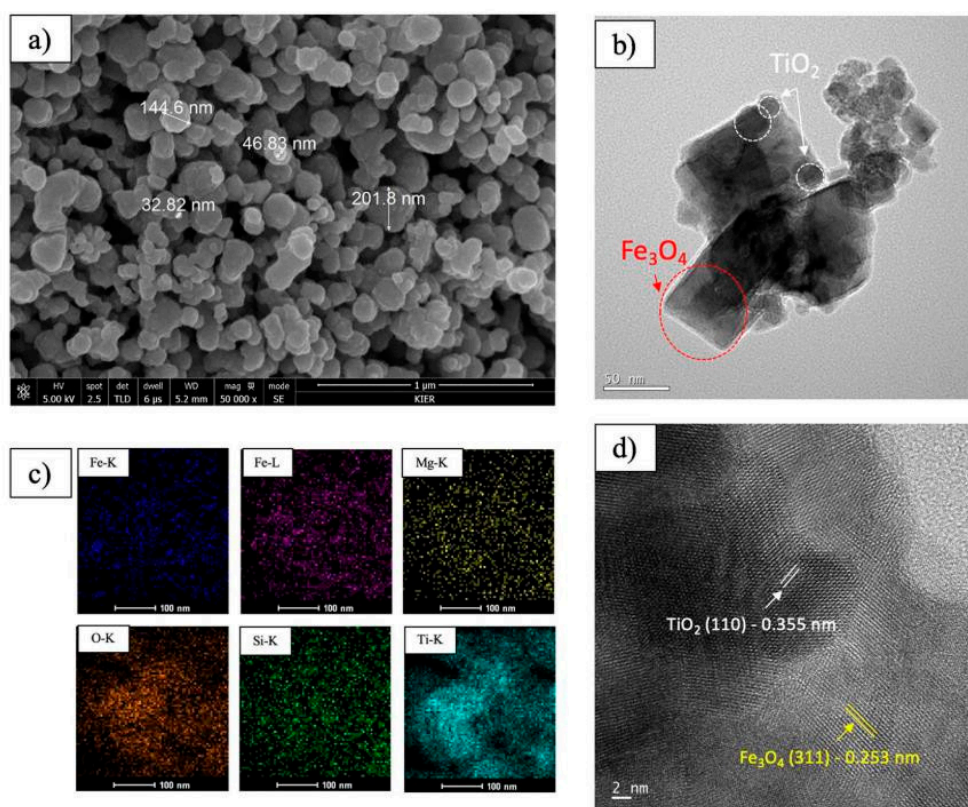


Figure S1. (a) SEM, (b) TEM, (c) EDX analysis, and (d) HRTEM of MgAC- $\text{Fe}_3\text{O}_4/\text{TiO}_2$. Reprinted with permission from Bui et al. (2019) [28]. Copyright 2019, Springer Nature.

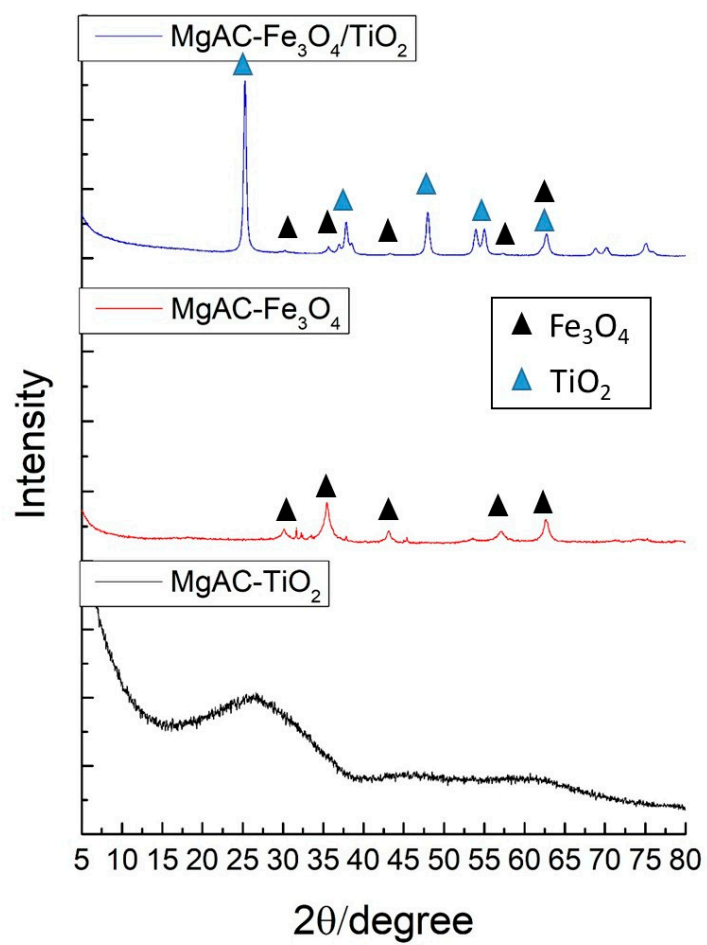


Figure S2. XRD patterns for MgAC-Fe₃O₄/TiO₂, MgAC-Fe₃O₄, and MgAC-TiO₂.

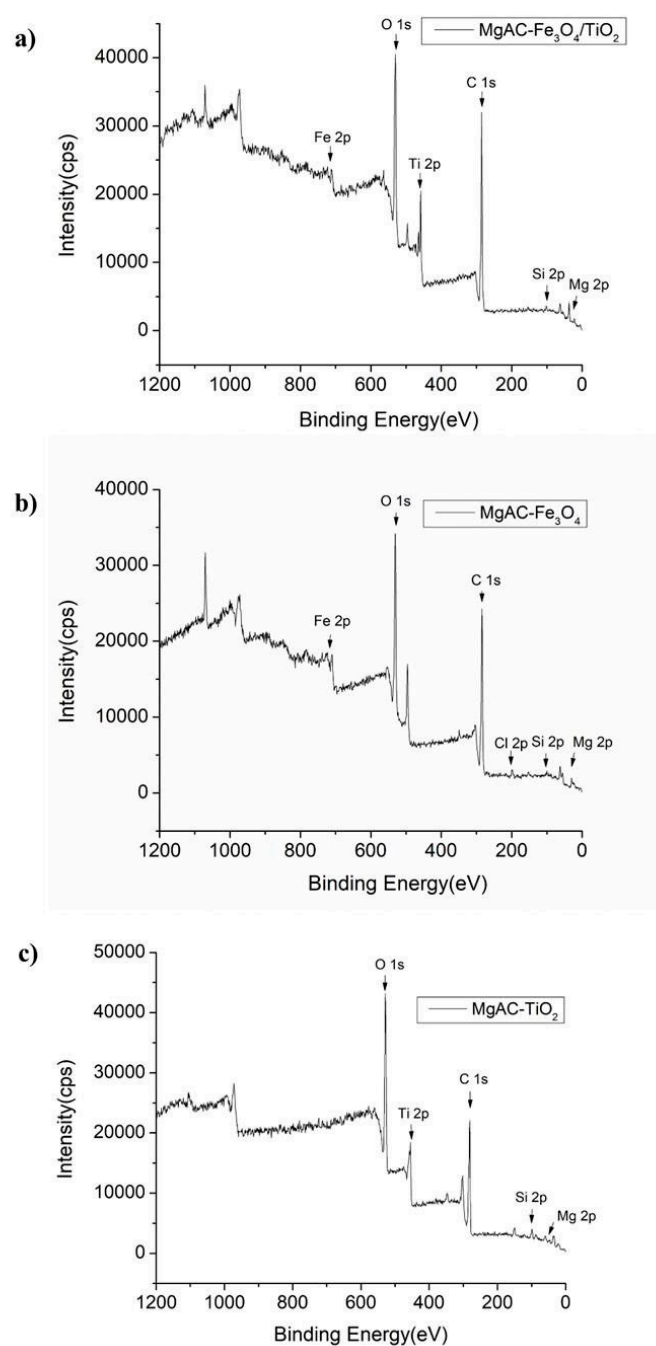


Figure S3. XPS full-survey spectra for (a) MgAC-Fe₃O₄/TiO₂, (b) MgAC-Fe₃O₄, and (c) MgAC-TiO₂.

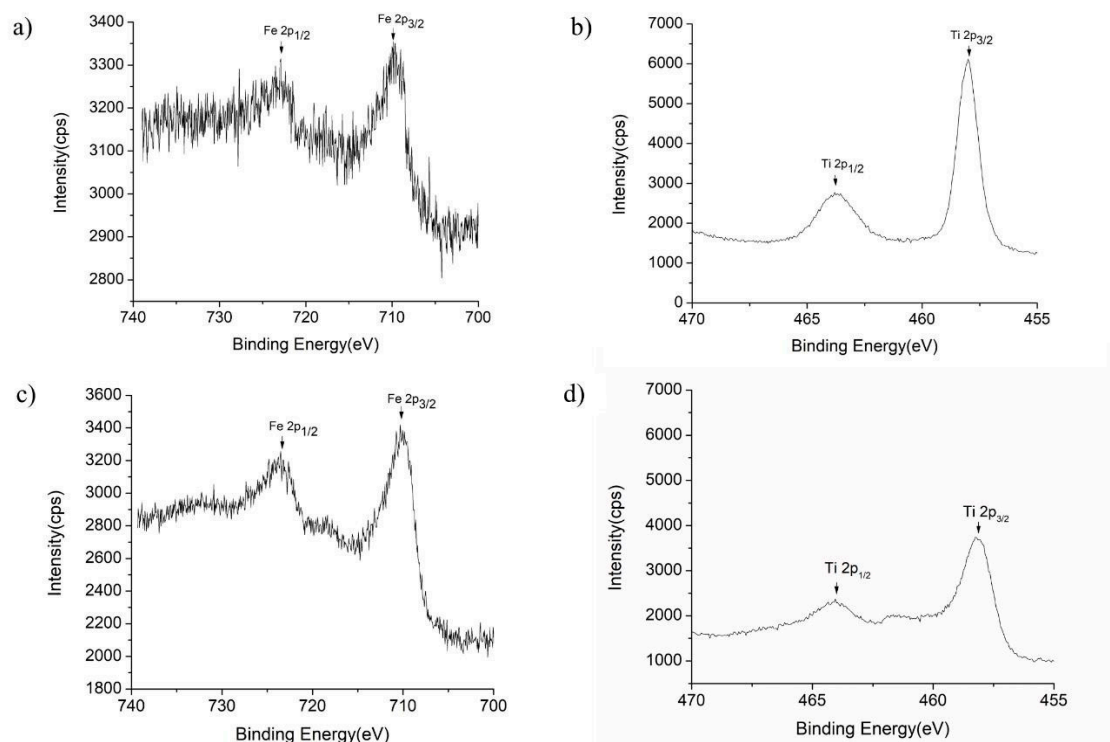


Figure S4. XPS spectra for (a) Fe 2p and (b) Ti 2p of MgAc-Fe₃O₄/TiO₂; (c) Fe 2p of MgAc-Fe₃O₄; and (d) Ti 2p of MgAc-TiO₂.

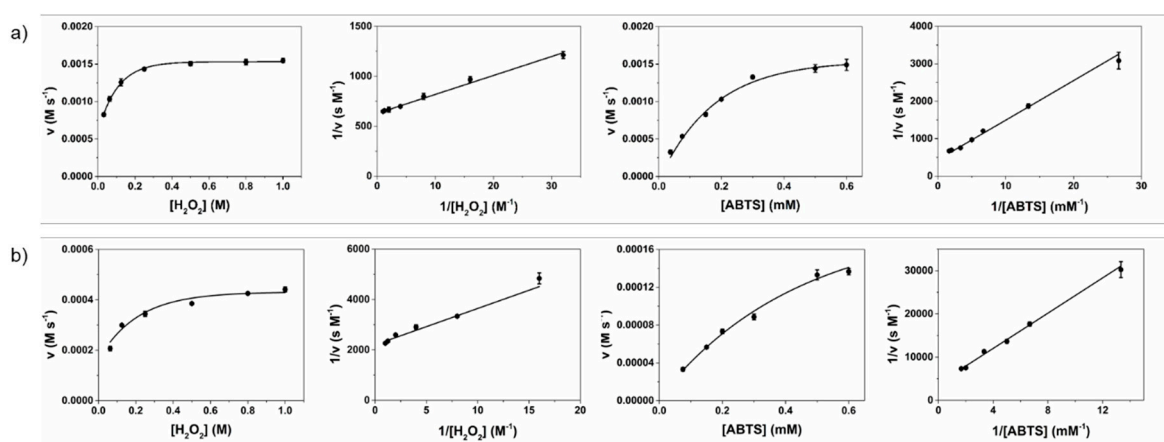


Figure S5. Steady-state kinetic assays of MgAc-Fe₃O₄/TiO₂ for H₂O₂ and ABTS in the (a) presence and (b) absence of UV-light irradiation, and their corresponding Lineweaver-Burk plots.

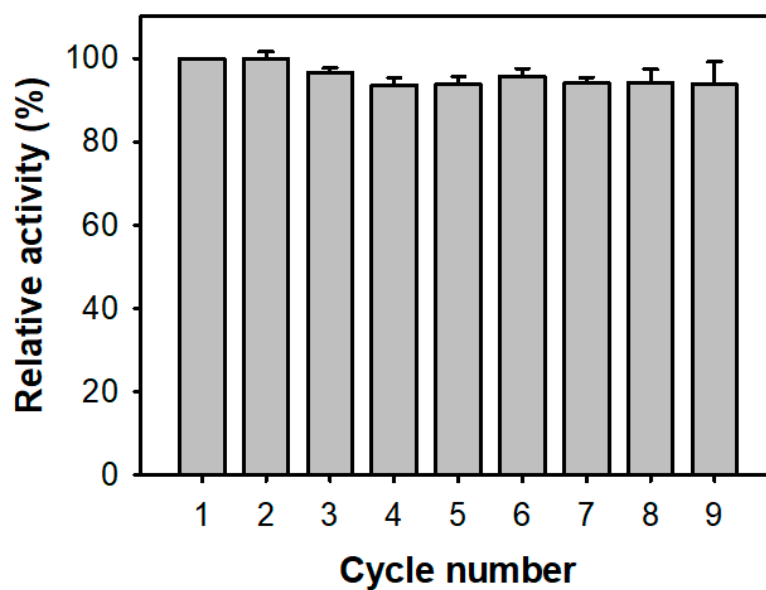


Figure S6. Reusability of MgAc-Fe₃O₄/TiO₂ hybrid for pyrocatechol determination.

Table S1. Kinetic parameters of MgAc-Fe₃O₄/TiO₂ with and without UV-light irradiation.

Conditions	Substrate	K_m (mM ⁻¹)	V_{max} (×10 ⁻⁸ M s ⁻¹)
With UV-light irradiation	ABTS	0.20	0.186
	H ₂ O ₂	28.80	0.145
Without UV-light irradiation	ABTS	0.56	0.025
	H ₂ O ₂	76.01	0.043

Table S2. Comparison of CVs and recovery values of MgAc-Fe₃O₄/TiO₂-based assay for phenolic compounds with those of previous nanomaterial-based strategies.

Method	Material	CV (%)	Recovery (%)	References
Electrochemistry	NaOH nanorods/GCE	0.57-2.85	85.1-99.5	[S1]
Electrochemistry	AuNPs@MoS ₂ -rGO	3.4-5.2	92.4-105.2	[S2]
Fluorometry	Si CNPs	1.2-6.9	92.5-101.0	[S3]
Colorimetry	ssDNA-AuNPs	1.8-7.7	95.0-116.0	[S4]
Colorimetry	MgAc-Fe ₃ O ₄ /TiO ₂	1.08-6.89	97.3-108.4	This work

References

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