Electronic Supplementary Material (ESI) for Environmental Science: Nano.

Electronic supplementary Information (ESI)

For

Boosting Heterogeneous Fenton Reactions for Degrading Organic Dyes via Photothermal Effect under Neutral Conditions

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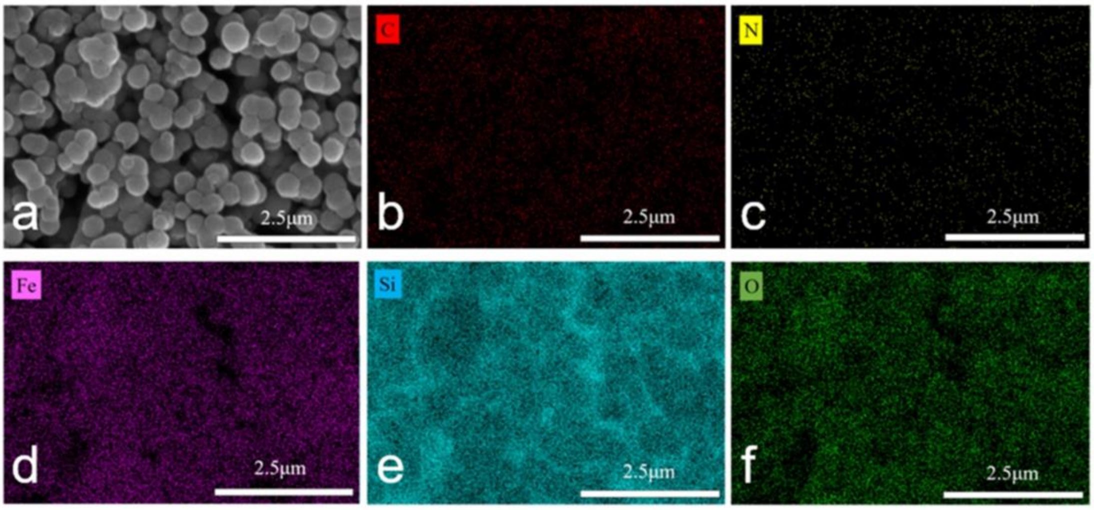

Figure S1. *Distribution of MIC elements: (a) SEM; (b) C; (c) N; (d)Fe; (e) Si; (f) O.*

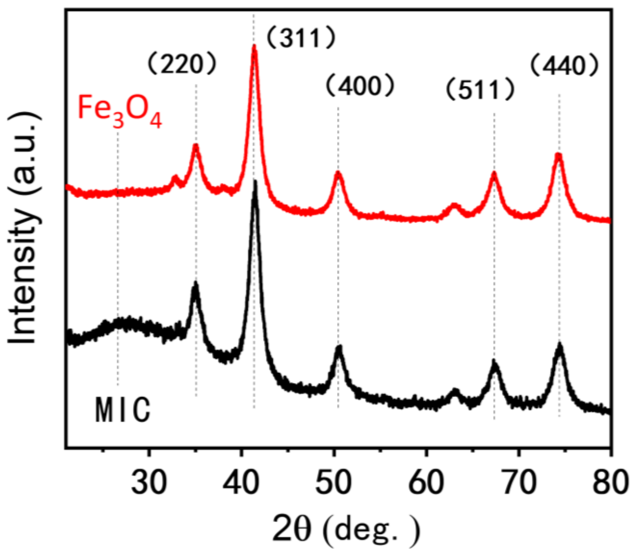

Figure S2. XRD pattern of the Fe_3O_4 nanoparticles and MIC.

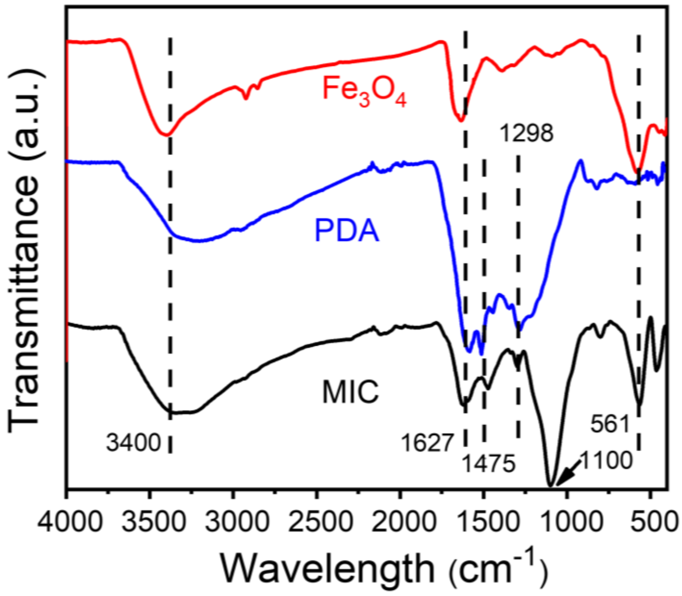

Figure S3. FTIR spectra of ultra-small Fe_3O_4 nanoparticles, PDA and MIC.

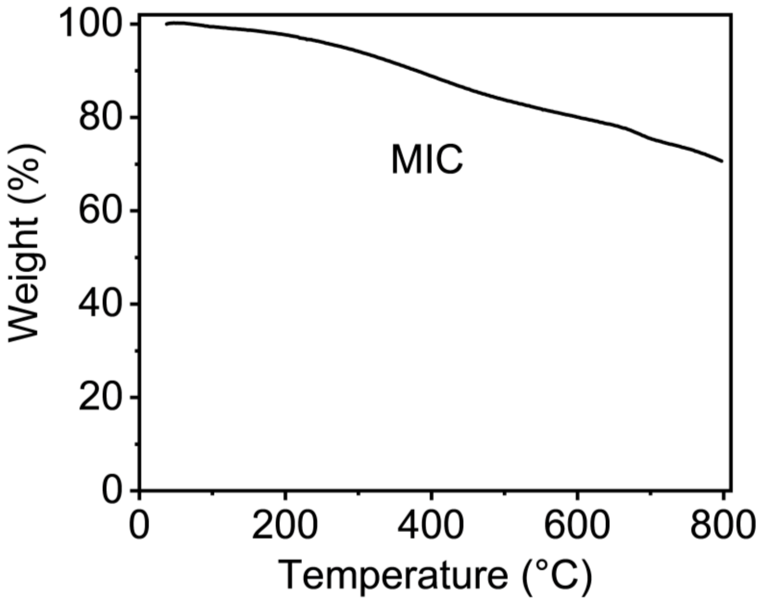

Figure S4. Thermogravimetric analysis (TGA) plot curve of MIC under with nitrogen atmosphere.

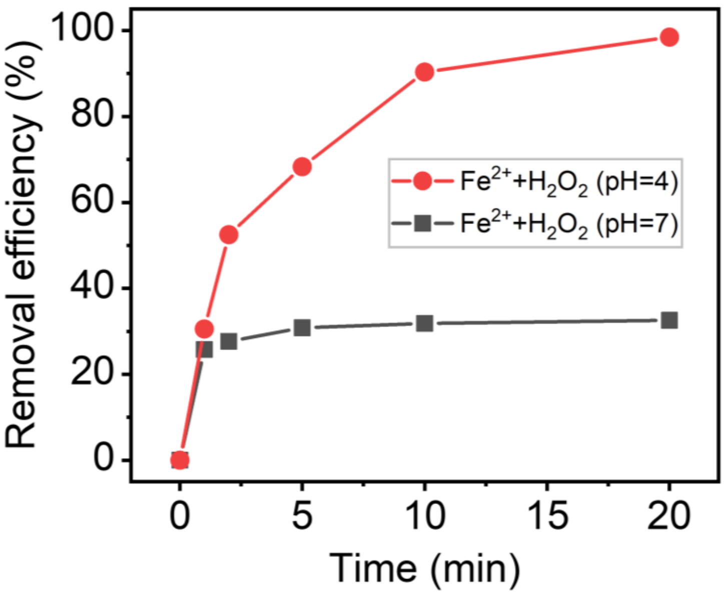

Figure S5. Homogeneous Fenton system (Fe^{2+}+H_2O_2) degraded MB solution at pH=4 and pH=7.

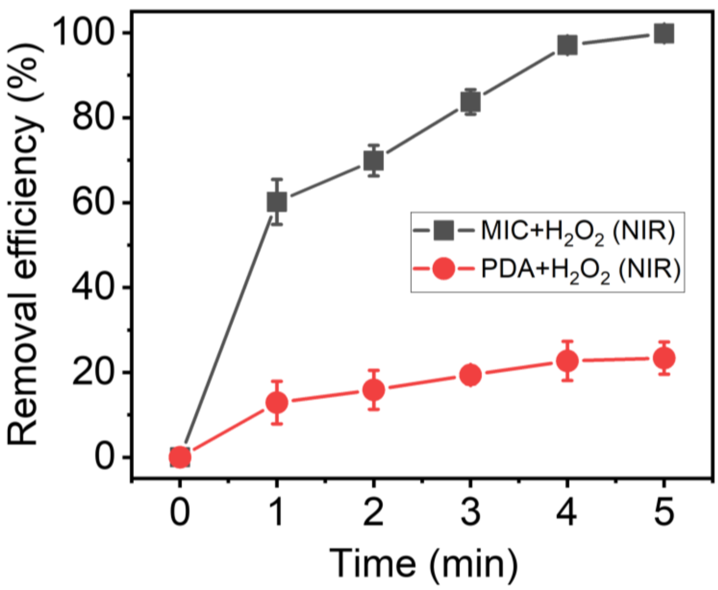

Figure S6. Removal efficiency of MIC+H_2O_2 and PDA+H_2O_2 to MB at different time.

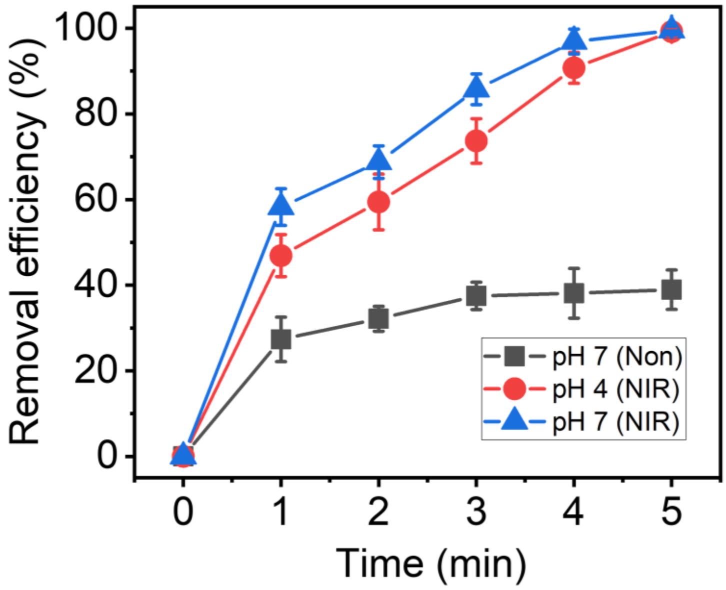

Figure S7. Effect of acid (pH 4) and neutral conditions on dye removal efficiency of MIC.

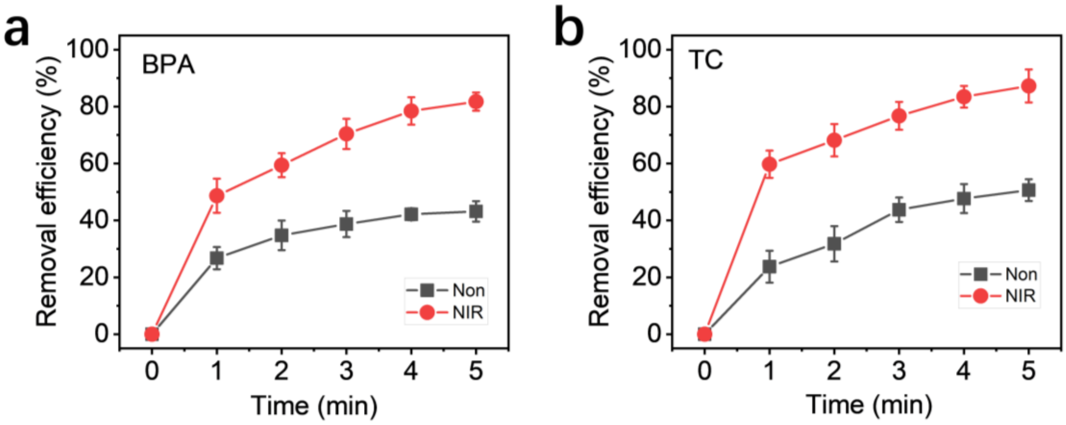

Figure S8. Degradation efficiency of MIC to BPA(a) and TC(b), (experimental conditions: MIC: 250 μg mL^{-1}; BPA: 22.8 mg/L, TC: 100 mg/L, pH 7).

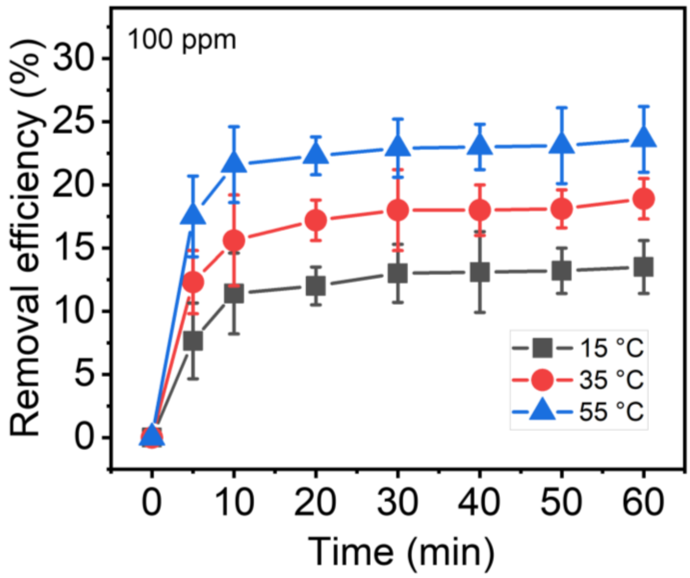

Figure S9. Effect of different temperatures on adsorption efficiency of MB by MIC (experimental conditions: MIC: 250 μg mL^{-1}; MB: 100 mg/L, pH 7).

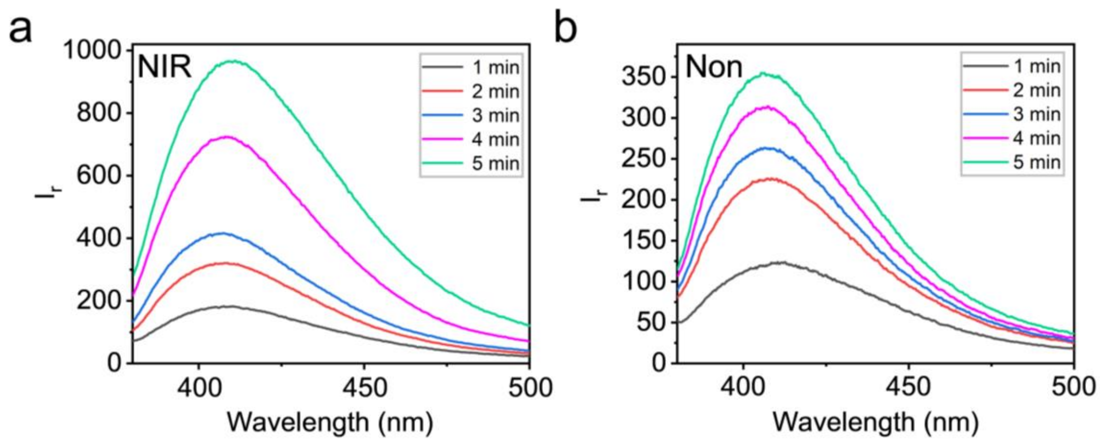

Figure S10. Fluorescence spectra of 2-hydroxyterephthalic acid (a) with or (b) without the NIR laser.

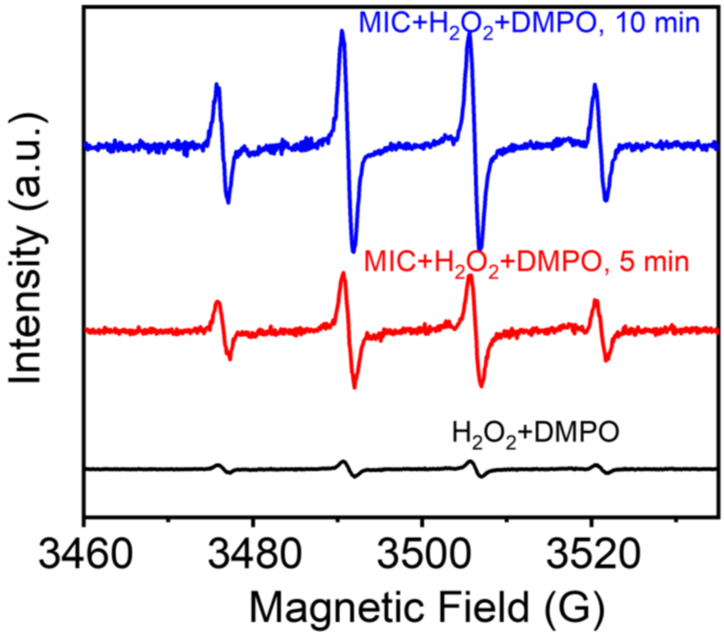

Figure S11. The EPR spectra of DMPO-OH adducts in the MIC+H_2O_2 system.

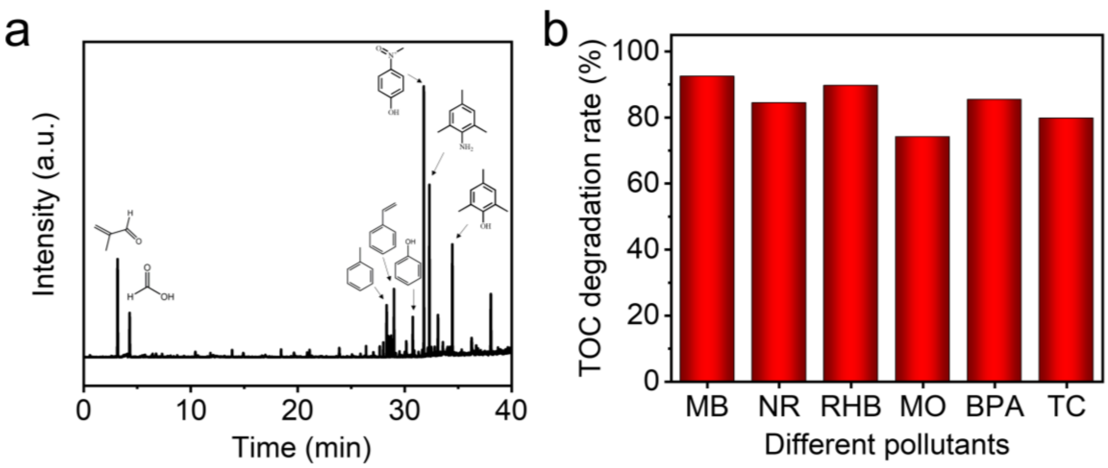

Figure S12. (a) GC-MS spectra in the degradation process of MB and (b) total organic carbon (TOC) degradation rate of different organic pollutants.

Table S1. Catalytic performance of multifarious Iron-based materials in different physical fields.

Catalysts/ concentration	Dye concentration (mg/L)	Time (min)	Dye removal rate (%)	pH	Physical field	Refer-ences
PCN-250 (Fe_2Mn)/327 μg mL^{-1}	15	270	100	2.0-12.0	Full-wavelength halogen lamp	1
Fe^{3+}/2.8 μg mL^{-1}	6	8	100	3.3	VUV/UV	2
BASF-NPs/250 μg mL^{-1}	10	140	100	7.0	UV	3
Fe^{2+}/20 μg mL^{-1}	50	6	98	3.0	Microwave heating	4
Fe^{0}/1000 μg mL^{-1}	35	5	99	3.0	Ultrasound	5
Fe_3O_4/ZnO/grap-hene	40	60	100	13.0	UV+US	6
SUS/Fe_3O_4/200 μg mL^{-1}	10	150	100	7.0	E beam	7
MIC (this work)/250 μg mL^{-1}	100	5	100	7.0	NIR irradiation	

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