

Supplementary Table S1 Summary of the experimental parameters and fitted kinetic constants of pNPP hydrolysis mediated by different iron oxyhydroxide nanomaterials at pH 6.0, 7.0, and 8.0 (Initial pNPP concentration: 6.0 mg L⁻¹)

Exp. No.	Catalyst	C_pNPP (mg L ⁻¹)	pH	k_{obs}^a (h ⁻¹)	R^2	$k_{\text{obs}}/SA_{\text{BET}}^b$ (g·h ⁻¹ ·m ⁻²)
1-a	Control	6.0	6.0	1.00×10^{-4}	0.945	-
1-b	Goethite	6.0	6.0	1.24×10^{-2}	0.996	1.72×10^{-4}
1-c	Akaganeite	6.0	6.0	9.03×10^{-3}	0.991	1.97×10^{-4}
1-d	Lepidocrocite	6.0	6.0	3.82×10^{-2}	0.989	2.26×10^{-4}
2-a	Control	6.0	7.0	1.00×10^{-4}	0.952	-
2-b	Goethite	6.0	7.0	9.00×10^{-3}	0.965	1.25×10^{-4}
2-c	Akaganeite	6.0	7.0	6.61×10^{-3}	0.967	1.44×10^{-4}
2-d	Lepidocrocite	6.0	7.0	2.91×10^{-2}	0.945	1.72×10^{-4}
3-a	Control	6.0	8.0	1.10×10^{-4}	0.906	-
3-b	Goethite	6.0	8.0	4.84×10^{-3}	0.946	6.72×10^{-5}
3-c	Akaganeite	6.0	8.0	3.60×10^{-3}	0.979	7.86×10^{-5}
3-d	Lepidocrocite	6.0	8.0	1.35×10^{-2}	0.987	8.74×10^{-5}

^a k_{obs} = pseudo-first-order kinetic constants

^b SA_{BET} = surface area measured using the Brunauer-Emmett-Teller (BET) method.