

Nano-sized iron oxides supported on polyester textile to remove fluoroquinolones in hospital wastewater

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Text S1: Potential reactions in the FeO_x/PMS system under irradiation.

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$\text{SO}_4^{\bullet-}/\bullet\text{OH} + \text{Organic compounds} \rightarrow \text{degradation products}$ (6)

Table S1. Inorganic species and physico-chemical characteristics of SWW and RHW

	SWW	RHW
pH	8.0±0.5	6.8±0.2
Turbidity (NTU)	2±1	196±5
Conductivity ($\mu\text{S cm}^{-1}$)	1250±5	1340±5
TOC (mg L^{-1})	70±5	50±10
Suspended solid (mg L^{-1})	0	20±2
Chloride (mg L^{-1})	450±20	620±10
Nitrate (mg L^{-1})	35±2	7±2
Sulfate (mg L^{-1})	20±2	60±10
Phosphate (mg L^{-1})	150±10	60±10

Synthetic wastewater (SWW) were prepared by adding 400 mg L^{-1} of NaCl, 50 mg L^{-1} of citric acid, 100 mg L^{-1} of sucrose and 230 mg L^{-1} Na_2HPO_4 to tap water (conductivity 408 $\mu\text{S cm}^{-1}$).

Table S2. Reactivity percentage of radicals with species in solution

k'' : second order rate constant and $k' = k'' * [\text{species}]$

% of reactivity indicates the percentage of hydroxyl radicals or sulfate radicals reacted.

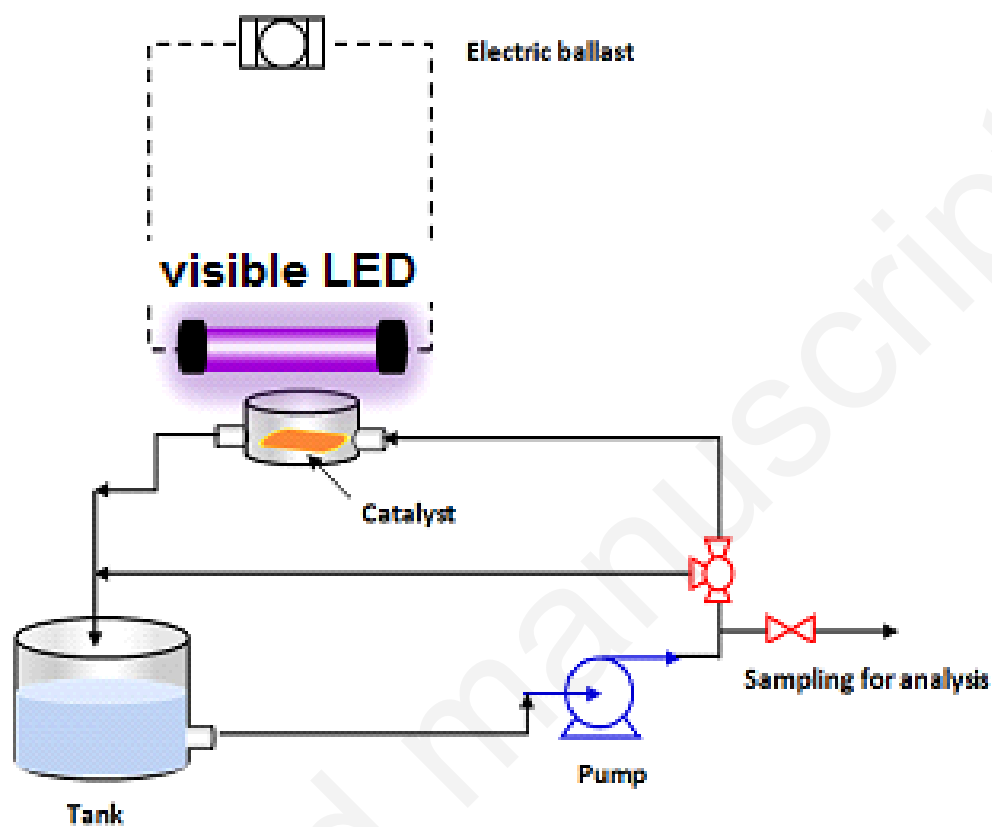


Fig. S1. Schematic diagram of recirculation glass reactor system

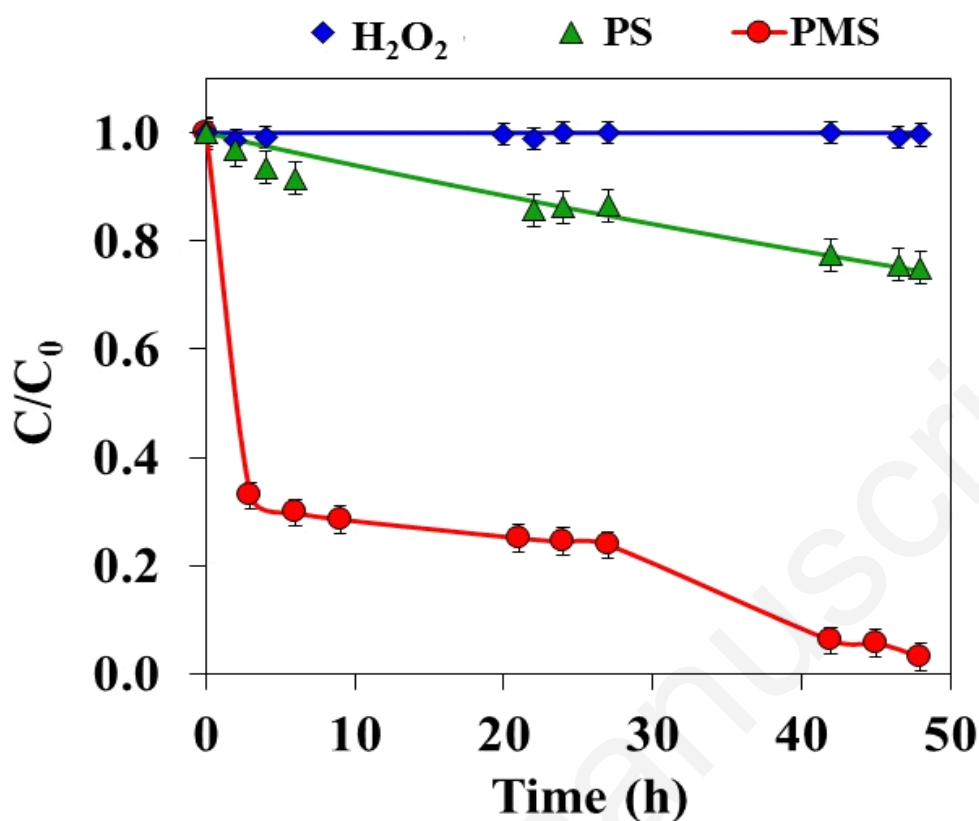


Fig. S2. Effect of oxidant on FLU removal with catalyst $FeOx_3$ under visible irradiation. Experimental conditions: $[FeOx_3] = 0.26 \text{ g m}^{-2}$ on PES, $[FLU]_0 = 5 \text{ }\mu\text{M}$, visible reaction time = 48 h, $pH_0 = 7.0 \pm 0.2$, $V = 200 \text{ mL}$, recirculation flow rate = 325 mL min^{-1} , $[H_2O_2]_0 = [PS]_0 = [PMS]_0 = 0.5 \text{ mM}$. Abbreviations: FLU = flumequine, PS = persulfate, H_2O_2 = hydrogen peroxide, PMS = peroxymonosulfate, $FeOx_3$ corresponding to 3% O_2 in the sputtering chamber. For PMS, the solid line is only a visual guide.

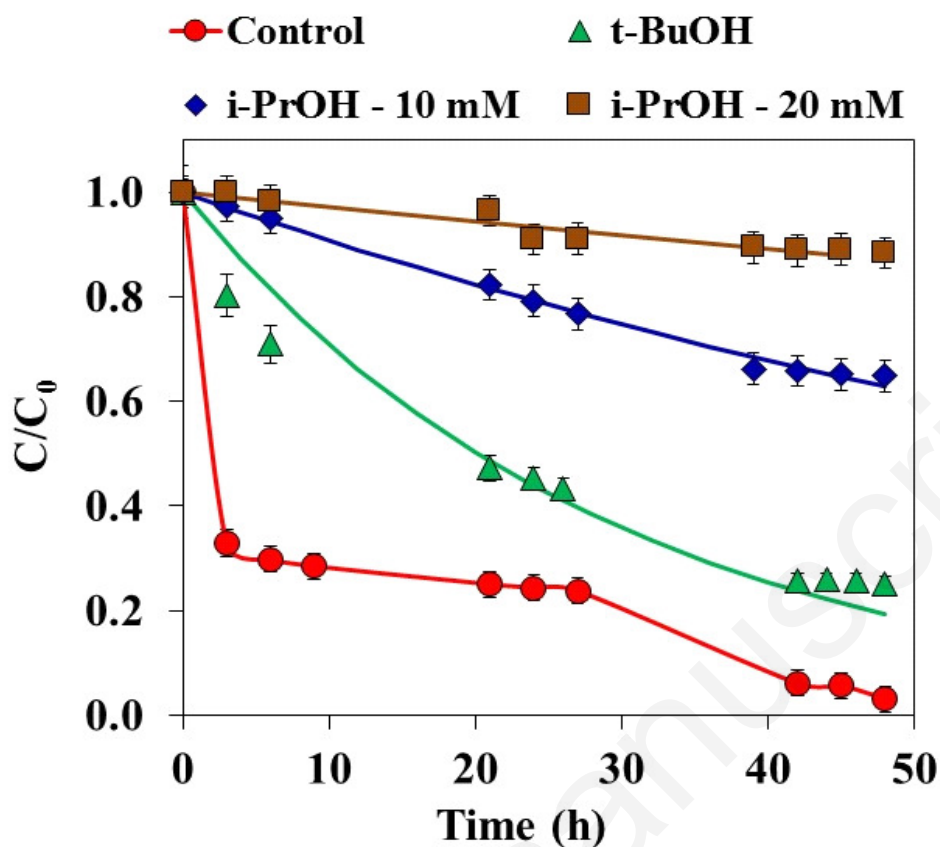


Fig. S3. Effect of radicals scavengers on FLU removal. Experimental conditions: $[\text{FLU}]_0 = 5 \mu\text{M}$, $[\text{PMS}]_0 = 0.5 \text{ mM}$, $[\text{FeOx}_3] = 0.26 \text{ g m}^{-2}$ on PES, reaction time = 48 h, $[\text{i-PrOH}]_0 = 10 - 20 \text{ mM}$, $[\text{t-BuOH}]_0 = 5 \text{ mM}$, visible reaction time = 48 h, $\text{pH}_0 = 7.0 \pm 0.2$, $V = 200 \text{ mL}$, recirculation flowrate = 325 mL min^{-1} . Abbreviations: FLU = flumequine, PMS = peroxymonosulfate, t-BuOH = tert-Butyl alcohol, i-PrOH = isopropanol, FeOx_3 corresponding to 3% O_2 in the sputtering chamber. For the control test, the solid line is only a visual guide.

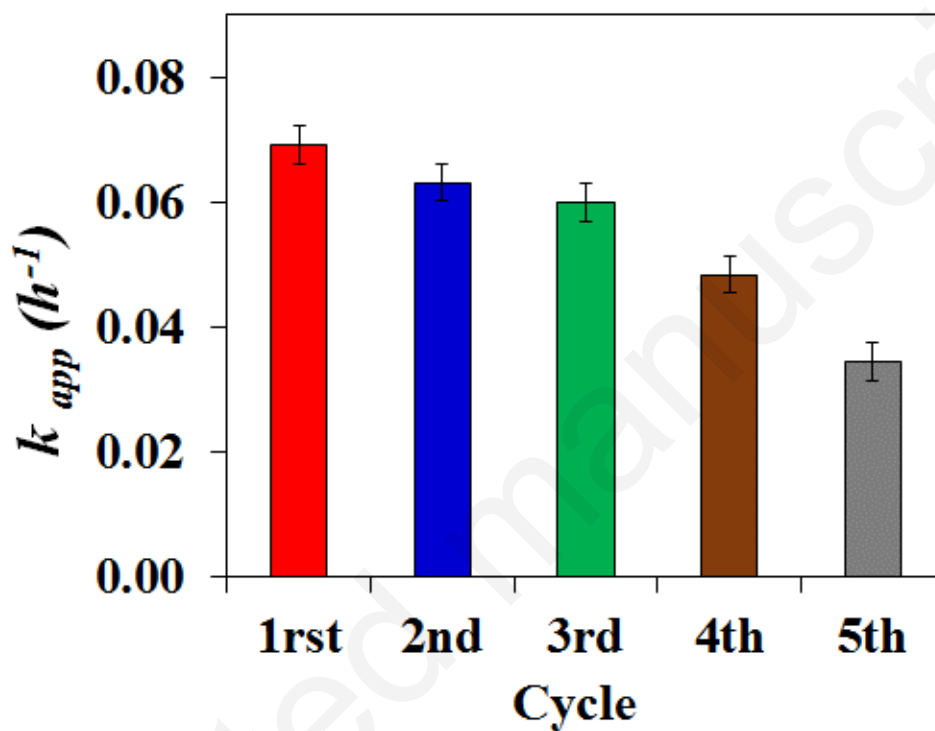


Fig. S4. FLU removal rate constant in RHW using $FeOx_3$ -PES for five successive oxidation runs. Experimental conditions: $[FLU]_0 = 5 \mu M$, $[PMS]_0 = 3 \text{ mM}$, $[FeOx_3] = 0.26 \text{ g m}^{-2}$ on PES, $pH_0 = 7.0 \pm 0.2$, reaction time = 48 h, recirculation flow rate = 325 mL min^{-1} . Abbreviations: FLU = flumequine, PMS = peroxymonosulfate, RHW = Real Hospital Wastewater, $FeOx_3$ corresponding to 3% O_2 in the sputtering chamber.