

Supplementary material

Photo-Fenton-like Treatment of Municipal Wastewater

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Table S1. R² and RMSE values for actual and predicted TC removal (%).

Hidden nodes	Training		Validation		Score
	R ²	RMSE	R ²	RMSE	
5	0.9724	1.2100	0.9558	2.0830	56.46
6	0.9658	1.3461	0.9739	1.5999	63.86
7	0.9730	1.4064	0.9970	0.2788	115.16
8	0.9902	0.7177	0.9756	1.5483	85.27
9	-0.0060	7.3087	-0.0665	10.2382	0.03
10	0.9335	1.8783	0.9814	1.3504	56.82
11	0.7690	3.8106	0.9853	0.9702	32.68
12	0.8152	3.1321	0.9746	1.5788	34.27
13	0.7213	3.8464	0.9591	2.0029	24.62
14	-0.0060	7.3087	-0.0665	10.2382	0.03
15	0.6964	4.7163	0.9180	1.4632	21.49
16	0.5455	4.9125	0.9830	1.2891	20.38
17	-0.0060	7.3087	-0.0665	10.2382	0.03
18	-0.0060	7.3087	-0.0665	10.2382	0.03
19	0.6739	4.1610	0.9819	1.3308	25.83
20	0.9863	1.0019	0.9999	0.0443	188.55

Table S2. R² and RMSE values for actual and predicted TOC removal (%).

Hidden nodes	Training		Validation		Score
	R ²	RMSE	R ²	RMSE	
5	0.9836	1.9011	0.9998	0.2982	89.44
6	0.9984	0.6146	0.9653	3.4919	46.97
7	0.9852	1.8103	0.9995	0.4355	87.70
8	0.9885	1.6890	1.0000	0.0263	115.26
9	0.9932	1.4407	0.9999	0.0570	132.63
10	0.9834	1.9152	1.0000	0.0149	101.91
11	0.9873	1.9536	0.9851	1.2340	61.03
12	0.9850	2.1408	1.0000	0.0145	91.42
13	0.9799	2.2307	1.0000	0.0137	87.34
14	0.9868	1.9950	0.9851	1.2334	60.22
15	0.9735	2.5630	1.0000	0.0004	75.98
16	0.9501	3.5153	1.0000	0.0111	53.96
17	0.9889	1.5686	1.0000	0.1121	117.67
18	0.0000	17.3679	0.0042	10.1319	0.00
19	0.9618	3.3949	0.9851	1.2333	40.96
20	0.9935	1.1989	0.9999	0.1610	146.10

Table S3. R² and RMSE values for actual and predicted TN removal (%).

Hidden nodes	Training		Validation		Score
	R ²	RMSE	R ²	RMSE	
5	0.9743	3.2111	0.9009	5.4923	20.23
6	0.9625	3.8770	0.8632	6.4531	16.18
7	0.9770	3.0346	0.9014	5.4798	20.75
8	0.8798	6.4946	0.9942	1.6802	21.56
9	0.9628	3.8624	0.8599	6.5306	16.03
10	0.8983	6.2723	0.9335	4.9227	14.99
11	-0.0006	20.0449	-0.0175	17.4474	0.00
12	0.7778	8.8315	0.9658	4.0958	11.90
13	0.7670	9.6723	0.9100	5.1883	9.53
14	-0.0006	20.0449	-0.0175	17.4474	0.00
15	-0.0006	20.0449	-0.0175	17.4474	0.00
16	-0.0006	20.0449	-0.0175	17.4474	0.00
17	-0.0006	20.0449	-0.0175	17.4474	0.00
18	0.3036	16.4103	0.9452	4.4662	4.72
19	0.9746	3.1941	0.9401	4.2699	24.57
20	0.9742	3.0107	0.9997	0.3707	57.62

Table S4. The concentrations of formic acid, acetic acid, intermediates, and CO₂ expressed in organic carbon (OC) for each run.

Run	Independent variables				Organic carbon, mg L ⁻¹				
	Time	pH	K ₂ S ₂ O ₈ , mM	Molar ratio K ₂ S ₂ O ₈ /Fe ²⁺	Initial	Formic acid	Acetic acid	Mineralized (CO ₂)	Remaining intermediates
1	60	5.35	30	10	20.30	0.00	0.42	9.30	10.58
2	100	3	30	10	20.62	0.02	0.61	5.77	14.22
3	140	5.35	20	7.5	21.84	0.09	0.00	12.68	9.07
4	100	3	10	10	21.78	0.21	0.00	11.55	10.02
5	140	3	20	10	20.11	0.23	0.92	9.43	9.53
6	140	5.35	30	10	21.15	0.21	0.80	15.63	4.51
7	100	5.35	20	10	20.40	0.28	0.65	11.37	8.10
8	100	7.7	10	10	21.53	0.06	0.00	16.42	5.05
9	100	5.35	20	10	21.38	0.25	0.55	12.75	7.82
10	60	5.35	20	7.5	18.78	0.25	0.48	8.65	9.40
11	60	3	20	10	21.09	0.25	0.71	5.21	14.92
12	60	5.35	10	10	19.10	0.22	0.46	10.88	7.54
13	140	5.35	20	12.5	20.28	0.23	0.01	12.90	7.14
14	100	7.7	20	12.5	20.28	0.12	0.00	14.67	5.49
15	100	3	20	7.5	19.04	0.28	0.73	7.13	10.90
16	140	7.7	20	10	19.04	0.12	0.00	12.95	5.97
17	100	3	20	12.5	21.04	0.26	0.77	11.74	8.28
18	100	5.35	20	10	21.04	0.23	0.00	10.99	9.82
19	100	7.7	20	7.5	19.13	0.00	0.00	15.13	4.00
20	60	5.35	20	12.5	19.13	0.00	0.00	10.68	8.45
21	100	5.35	10	7.5	18.62	0.25	0.00	11.35	7.02
22	100	5.35	30	12.5	20.04	0.00	1.74	10.81	7.49
23	60	7.7	20	10	20.02	0.00	2.66	17.48	0.00
24	100	7.7	30	10	18.88	0.15	0.00	18.53	0.19
25	100	5.35	10	12.5	18.88	0.00	0.00	12.63	6.25
26	100	5.35	30	7.5	20.77	0.00	0.00	15.81	4.96
27	140	5.35	10	10	18.45	0.12	0.00	12.04	6.29
RSM – TC opt.	60	3	10	12.5	18.90	0.06	0.26	8.58	10.00
RSM – TOC opt.	106.06	7.7	30	7.5	18.58	0.00	0.00	18.58	0.00
RSM – TN opt.	97.98	4.33	15.05	12.5	21.00	0.00	0.00	10.44	10.56
ANN – TC opt.	140	5.21	30	10.17	19.40	0.00	0.00	9.84	9.56
ANN – TOC opt.	104.93	7.7	30	9.57	19.01	0.00	0.00	19.01	0.00
ANN – TN opt.	71.46	4.2	17.59	12.5	18.20	0.00	0.00	9.02	9.18

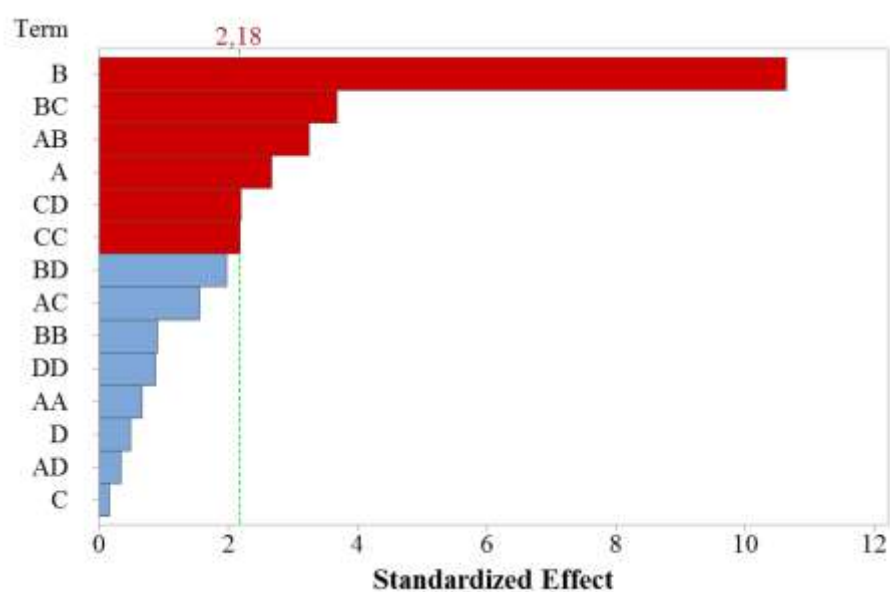


Figure S1. Pareto chart of the standardized effects (response is TOC removal (%); the reference line is at 2.18, $\alpha=0.05$): (A) reaction time, (B) pH, (C) $K_2S_2O_8$, (D) $K_2S_2O_8/Fe^{2+}$.