

Supplementary material

**Study of the Photocatalytic Activity of TiO₂ and Fe²⁺ in
the Activation of Peroxymonosulfate**

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Table S1. Analysis of variance (ANOVA) for the different factor combination (PMS, Fe²⁺ and TiO₂). The degrees of freedom used (df), the sum of squares, the mean square and the F and p values are shown.

a) Considering 10 minutes after treatment in combination with UV-A radiation.

Radiation	Source	df	Sum of squares	Mean squares	F-value	p-value
UV-A	Model	8	2.0109	0.2514	340.52	0.000
	Linear	3	1.7109	0.5703	772.60	0.000
	PMS	1	1.1650	1.1650	1578.29	0.000
	TiO ₂	1	0.2769	0.2769	375.07	0.000
	Fe ²⁺	1	0.2690	0.2690	364.43	0.000
	2-Way Interactions	3	0.1552	0.0517	70.08	0.000
	PMS/TiO ₂	1	0.0600	0.0600	81.23	0.000
	PMS/Fe ²⁺	1	0.0896	0.0896	121.40	0.000
	TiO ₂ /Fe ²⁺	1	0.0056	0.0056	7.60	0.025
	3-Way Interactions	1	0.0104	0.0104	14.16	0.006
	PMS/TiO ₂ /Fe ²⁺	1	0.0104	0.0104	14.16	0.006
	Curvature	1	0.1344	0.1344	182.00	0.000
	Error	8	0.0059	0.0007		
	Total	16	2.0168			

b) considering 10 minutes after treatment in combination with UV-C radiation.

Radiation	Source	df	Sum of squares	Mean squares	F-value	p-value
UV-C	Model	8	2.0919	0.2615	69.16	0.000
	Linear	3	1.7926	0.5975	158.04	0.000
	PMS	1	0.8638	0.8638	228.46	0.000
	TiO ₂	1	0.7044	0.7044	186.31	0.000
	Fe ²⁺	1	0.2244	0.2244	59.35	0.000
	2-Way Interactions	3	0.1325	0.0442	11.68	0.003
	PMS/TiO ₂	1	0.1068	0.1068	28.23	0.001
	PMS/Fe ²⁺	1	0.0085	0.0085	2.25	0.172
	TiO ₂ /Fe ²⁺	1	0.0173	0.0173	4.57	0.065
	3-Way Interactions	1	0.1453	0.1453	38.42	0.000
	PMS/TiO ₂ /Fe ²⁺	1	0.1453	0.1453	38.42	0.000
	Curvature	1	0.0215	0.0215	5.69	0.044
	Error	8	0.0302	0.0038		
	Total	16	2.1221			

c) considering 5 minutes after treatment in combination with UV-A radiation.

Radiation	Source	df	Sum of squares	Mean squares	F-value	p-value
UV-A	Model	8	1.7256	0.2157	216.22	0.000
	Linear	3	1.4186	0.4729	474.02	0.000
	PMS	1	0.8883	0.8883	890.49	0.000
	TiO ₂	1	0.2440	0.2440	244.59	0.000
	Fe ²⁺	1	0.2863	0.2863	286.99	0.000
	2-Way Interactions	3	0.2925	0.0975	97.73	0.000
	PMS/TiO ₂	1	0.1051	0.1051	105.39	0.000
	PMS/Fe ²⁺	1	0.1610	0.1610	161.40	0.000
	TiO ₂ /Fe ²⁺	1	0.0263	0.0263	26.39	0.001
	3-Way Interactions	1	0.0015	0.0015	1.53	0.252
	PMS/TiO ₂ /Fe ²⁺	1	0.0015	0.0015	1.53	0.252
	Curvature	1	0.0130	0.0130	13.00	0.007
	Error	8	0.0080	0.0010		
	Total	16	1.7336			

d) considering 5 minutes after treatment in combination with UV-C radiation.

Radiation	Source	df	Sum of squares	Mean squares	F-value	p-value
UV-C	Model	8	2.3672	0.2959	43.54	0.000
	Linear	3	2.0315	0.6772	99.63	0.000
	PMS	1	1.0743	1.0743	158.07	0.000
	TiO ₂	1	0.5424	0.5424	79.80	0.000
	Fe ²⁺	1	0.4148	0.4148	61.03	0.000
	2-Way Interactions	3	0.1194	0.0398	5.86	0.020
	PMS/TiO ₂	1	0.0041	0.0041	0.61	0.458
	PMS/Fe ²⁺	1	0.0752	0.0752	11.06	0.010
	TiO ₂ /Fe ²⁺	1	0.0401	0.0401	5.90	0.041
	3-Way Interactions	1	0.2039	0.2039	30.00	0.001
	PMS/TiO ₂ /Fe ²⁺	1	0.2039	0.2039	30.00	0.001
	Curvature	1	0.0124	0.0124	1.83	0.213
	Error	8	0.0544	0.0068		
	Total	16	2.4216			

Table S2. Standardised effects for the different factor combination (PMS, Fe²⁺ and TiO₂). Estimated numerical regression effects, regression coefficients, standard error (SE), standardised effects (t-value) and p-value, for student's t-test, are shown.

a) at 10 minutes of treatment in combination with UV-A radiation.

Radiation	Term	Effect	Coeff.	Coeff. SE	T value	P value	VIF
UV-A	Constant		0.3397	0.0068	50.02	0.000	
	PMS	0.5397	0.2698	0.0068	39.73	0.000	1.00
	TiO ₂	0.2631	0.1315	0.0068	19.37	0.000	1.00
	Fe ²⁺	0.2593	0.1297	0.0068	19.09	0.000	1.00
	PMS/TiO ₂	0.1224	0.0612	0.0068	9.01	0.000	1.00
	PMS/Fe ²⁺	0.1497	0.0748	0.0068	11.02	0.000	1.00
	TiO ₂ /Fe ²⁺	0.0374	0.0187	0.0068	2.76	0.025	1.00
	PMS/TiO ₂ /Fe ²⁺	-0.0511	-0.0255	0.0068	-3.76	0.006	1.00
	Central point		0.3778	0.0280	13.49	0.000	1.00

b) at 10 minutes of treatment in combination with UV-C radiation.

Radiation	Term	Effect	Coeff.	Coeff. SE	T value	P value	VIF
UV-A	Constant		0.6262	0.0154	40.73	0.000	
	PMS	0.4647	0.2324	0.0154	15.12	0.000	1.00
	TiO ₂	0.4196	0.2098	0.0154	13.65	0.000	1.00
	Fe ²⁺	0.2368	0.1184	0.0154	7.70	0.000	1.00
	PMS/TiO ₂	-0.1634	-0.0817	0.0154	-5.31	0.001	1.00
	PMS/Fe ²⁺	0.0461	0.0230	0.0154	1.50	0.172	1.00
	TiO ₂ /Fe ²⁺	-0.0657	-0.0329	0.0154	-2.14	0.065	1.00
	PMS/TiO ₂ /Fe ²⁺	-0.1906	-0.0953	0.0154	-6.20	0.000	1.00
	Central point		-0.1511	0.0634	-2.38	0.044	1.00