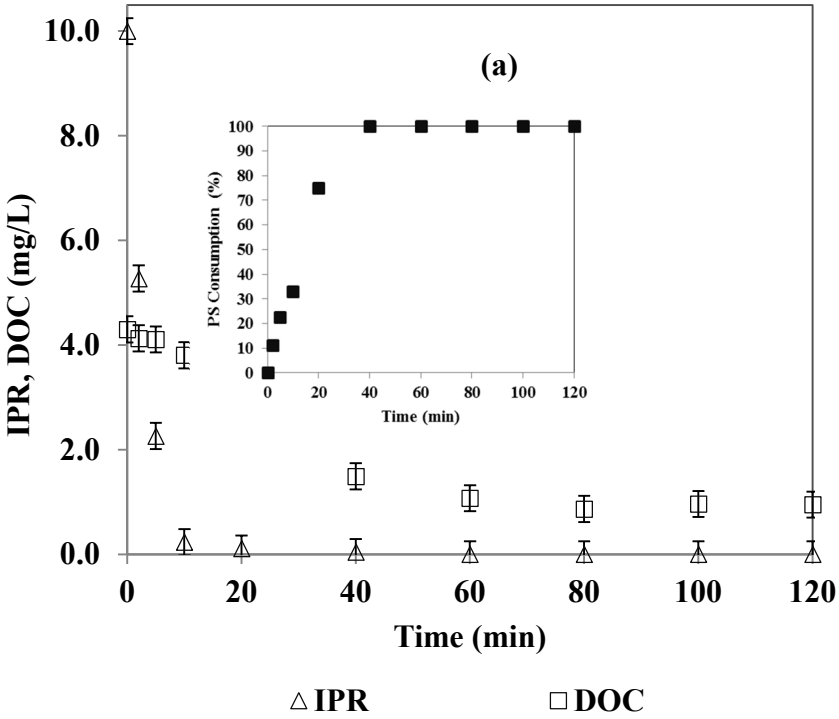
water

Supplementary Material

Iprodione Removal by UV-light-, Zero-Valent Iron- and Zero-Valent Aluminium-Activated Persulfate Oxidation Processes in Pure Water and Simulated Tertiary Treated Urban Wastewater



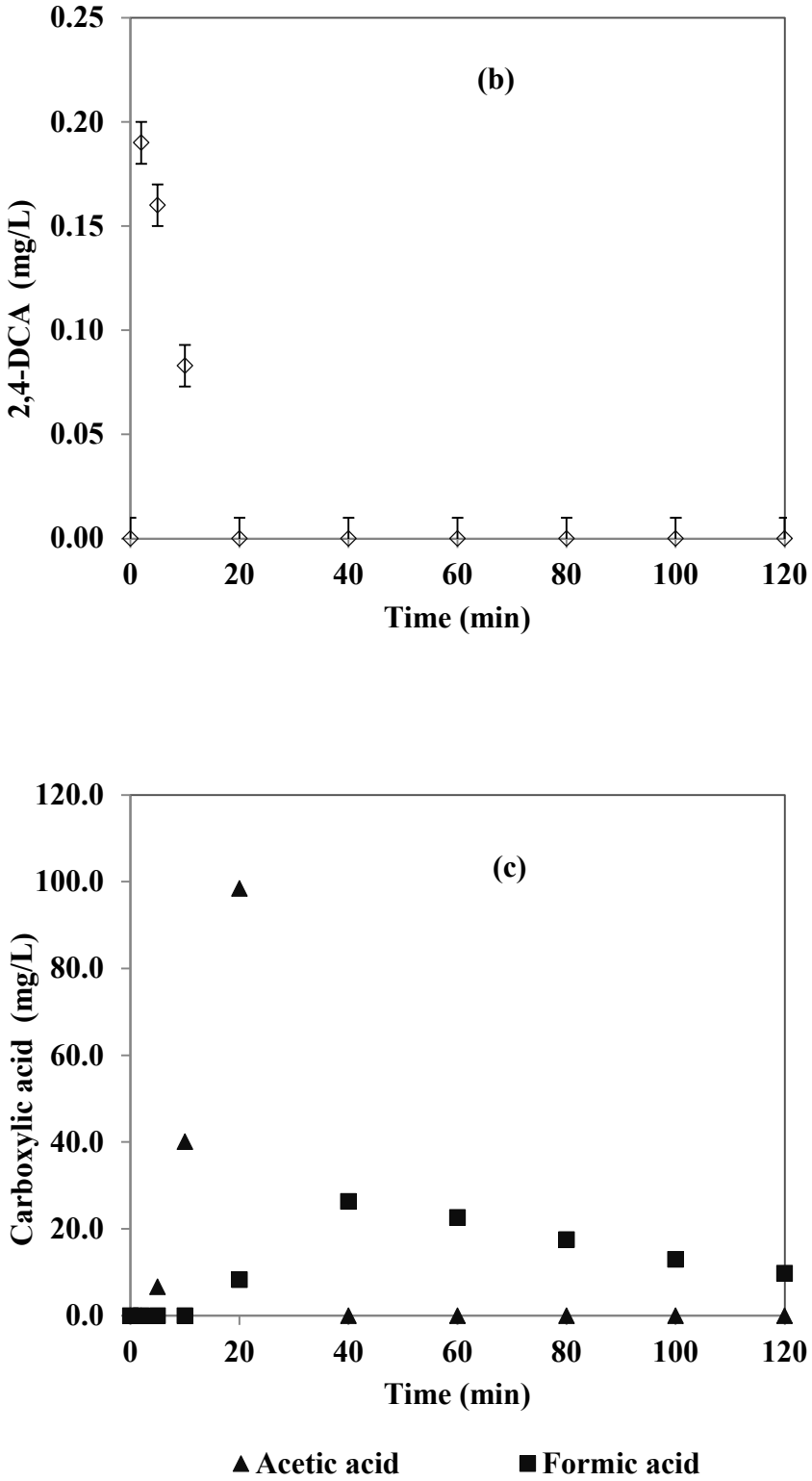


Figure 1. Changes in IPR and DOC (a), 2,4-DCA (b) and carboxylic acids (c) concentrations during UV-C/PS treatment of IPR in DW. IPR=10 mg/L; PS=0.30 mM; DOC of 10 mg/L IPR=4.3 mg/L; UV-C intensity=0.5 W/L; pH=6.2. Figure S1 (a) insert shows the calculated PS consumptions (%) during UV-C/PS treatment of 10 mg/L IPR in DW.

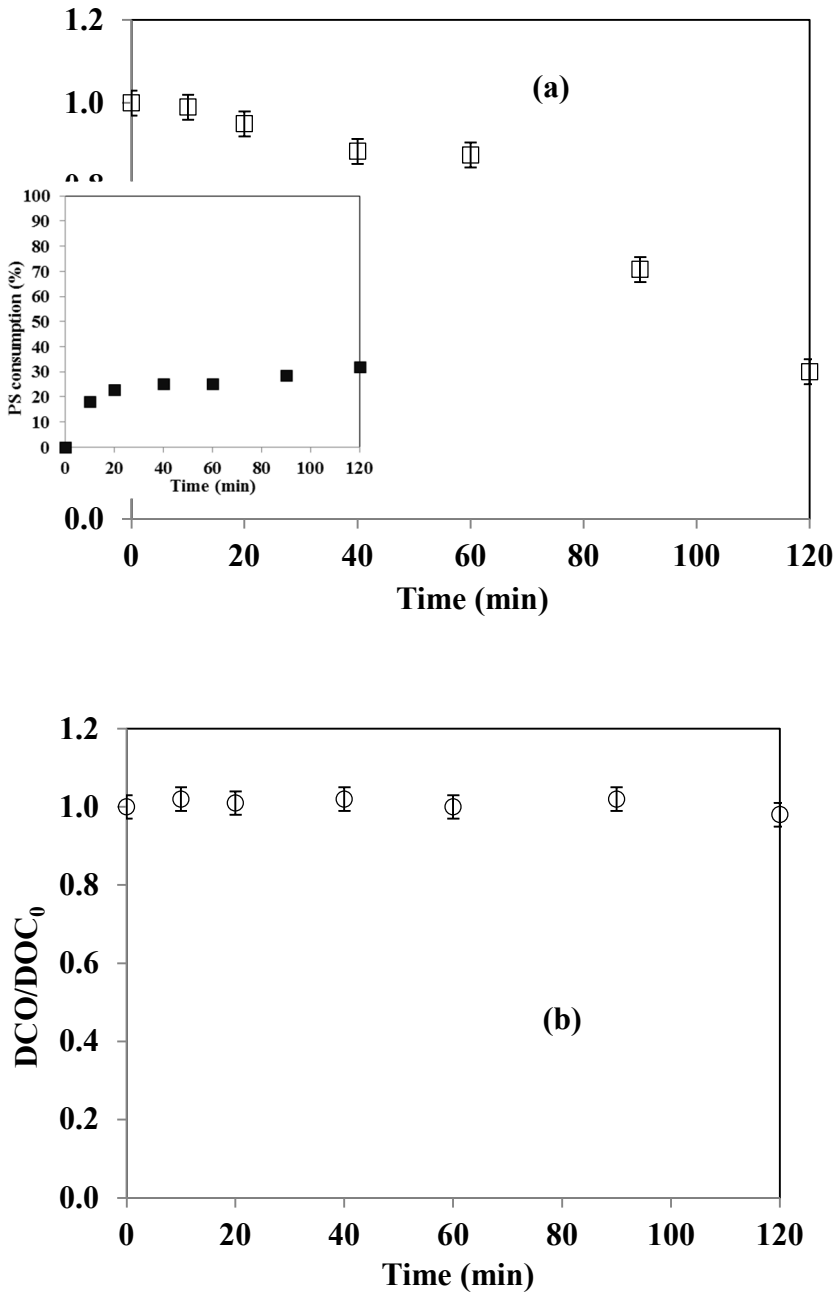


Figure 2. Changes in normalized IPR (a) and DOC (b) values during ZVA/PS treatment in DW. IPR=10 mg/L; PS=2.50 mM; DOC for 10 mg/L IPR=4.3 mg/L; ZVA=1 g/L; pH=3.0. Figure S2 (a) insert shows the calculated PS consumptions (%) during ZVA/PS treatment of 10 mg/L IPR in DW.

Table 1. IPR removals obtained during mere ZVI treatment at an initial pH of 5.0, mere ZVA treatment at an initial pH of 3.0 as well as mere PS treatment of IPR at pH = 6.2. IPR=2 mg/L; ZVI=1 g/L; ZVA=1 g/L; PS=1.00 mM.

Time (min)	IPR Removal (%)		
	Mere ZVI	Mere ZVA	Mere PS
0	0	0	0
2	0	0	0
5	0	8	0
10	0	7	0
20	0	12	0
40	0	22	0
60	0	24	0
80	0	32	0
100	0	33	0
120	2	35	1

Table 2. IPR removals obtained during ZVI/PS treatment in DW. IPR=2 mg/L; ZVI=1 g/L.

Time (min)	IPR Removal (%)					
	0.10 mM PS, pH=5.0	0.25 mM PS, pH=5.0	0.50 mM PS, pH=5.0	0.75 mM PS, pH=5.0	1.00 mM PS, pH=5.0	0.50 mM PS, pH=3.0
0	0	0	0	0	0	0
2	0	0	0	0	0	76
5	0	0	0	0	0	92
10	0	2	0	0	0	100
20	0	1	0	0	0	100
40	0	2	0	0	4	100
60	0	6	0	24	34	100
80	0	0	16	25	100	100
100	0	1	40	47	100	100
120	0	4	100	100	100	100

Table 3. IPR removals obtained during ZVA/PS treatments in DW. IPR=2 mg/L; ZVA=1 g/L.

Time (min)	IPR Removal (%)					
	0.10 mM PS, pH=3.0	0.25 mM PS, pH=3.0	0.50 mM PS, pH=3.0	0.75 mM PS, pH=3.0	1.00 mM PS, pH=3.0	0.50 mM PS, pH=1.5
0	0	0	0	0	0	0
2	8	0	0	0	6	12
5	0	4	7	0	5	14
10	5	3	6	0	9	20
20	5	12	8	10	14	22
40	29	44	14	25	24	29
60	38	51	26	41	40	48
80	55	64	66	71	58	69
100	68	79	86	89	85	91
120	82	80	100	100	100	100

Table 4. IPR and DOC removals as well as PS consumptions obtained during ZVI/PS treatment in DW. IPR=10 mg/L; DOC=4.3 mg/L; PS=2.50 mM; ZVI=1 g/L; pH=3.0.

Time (min)	IPR Removal (%)	DOC Removal (%)	PS Consumption (%)
0	0	0	0
10	97	0	77
20	~100	10	79

40	~100	17	80
60	~100	17	81
90	~100	19	83
120	~100	21	85

Table 5. IPR and DOC removals as well as PS consumptions during ZVA/PS treatment in DW. IPR=10 mg/L; PS=2.50 mM; DOC for 10 mg/L IPR=4.3 mg/L; ZVA=1 g/L; pH=3.0.

Time (min)	IPR Removal (%)	DOC Removal (%)	PS Consumption (%)
0	0	0	0
10	1	0	18
20	5	0	23
40	12	0	25
60	13	0	25
90	40	0	28
120	65	2	33

Table 6. IPR and DOC removals as well as PS consumptions during ZVI/PS treatments in SWW. IPR=2 mg/L; DOC=11.4 mg/L; PS=1.50 mM; ZVI=1 g/L, pH=3.0.

Time (min)	IPR Removal (%)	DOC Removal (%)	PS Consumption (%)
0	0	0	0
2	14	15	10
5	47	16	21
10	54	25	38
20	100	30	53
40	100	32	91
60	100	36	92
80	100	38	94
100	100	37	88
120	100	40	86

Table 7. IPR and DOC removals as well as PS consumptions during ZVA/PS treatments in SWW. IPR=2 mg/L; DOC=11.96 mg/L; PS=1.50 mM; ZVA=1 g/L, pH=3.0.

Time (min)	IPR Removal (%)	DOC Removal (%)	PS Consumption (%)
0	0	0	0
20	0	3	-
40	0	5	-
60	0	5	-
80	1	8	-
100	1	9	-
120	4	9	5