Supplementary File

Microwave-hydrogen peroxide assisted anaerobic treatment as an effective method for short-chain fatty acids production from tannery sludge

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Table S1. Summary of the main results (average data) obtained in the mesophilic (M8, M12, M8-P) anaerobic fermentation of tannery sludge.

Parameter	**Unit**	**Series M8**				**Series M12**				**Series M8-P**			
		pH 5.0	pH 7.0	pH 9.0	pH 11.0	pH 5.0	pH 7.0	pH 9.0	pH 11.0	pH 5.0	pH 7.0	pH 9.0	pH 11.0
SCFAs	g COD/L	9.49	9.35	9.59	10.3	14.7	14.6	15.5	15.8	17.3	16.8	17.1	17.7
$SCFAs/COD_{SOL}$	COD/COD	0.72	0.72	0.74	0.70	0.74	0.72	0.73	0.75	0.75	0.70	0.76	0.73
Y_F	$gCOD_{SCFA}/gVS_0$	0.16	0.16	0.17	0.17	0.17	0.17	0.18	0.18	0.29	0.28	0.29	0.30
Acetic acid	g COD/L	4.73	4.73	4.52	4.23	6.22	6.13	6.78	6.05	9.06	7.95	9.86	8.51
Propionic acid	g COD/L	1.33	1.25	1.07	1.21	1.79	2.08	2.18	2.18	1.88	2.00	1.28	1.81
Isobutyric acid	g COD/L	0.57	0.88	0.82	0.71	0.99	0.99	1.04	1.14	0.93	1.00	0.99	1.09
Butyric acid	g COD/L	1.71	1.38	1.87	2.23	3.59	2.93	3.23	3.40	3.36	3.39	3.09	4.30
Isovaleric acid	g COD/L	0.50	0.89	1.00	1.48	1.94	2.02	2.11	2.15	1.83	1.91	1.81	1.81
Valeric acid	g COD/L	0.65	0.21	0.33	0.35	0.21	0.5	0.18	0.89	0.25	0.17	0.17	0.21
COD_{SOL}	g COD/L	13.1	13.0	12.5	14.7	19.9	20.3	21.3	21.2	23.0	23.8	22.6	24.4
Alkalinity	g $CaCO_3$/L	2.50	2.48	2.54	2.50	2.49	2.46	2.46	2.52	2.58	2.63	2.64	2.63
$N\text{-}NH_4^+$	mg/L	770	785	776	795	1132	1204	1167	1221	1620	1610	1638	1550
$P\text{-}PO_4^{3-}$	mg/L	0.93	1.17	0.99	1.56	1.77	2.34	1.88	2.02	2.62	2.55	2.16	2.26
Chromium VI	mg/L	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03

Table S2. Summary of the main results (average data) obtained in the thermophilic (T8, T12, T8-P) anaerobic fermentation of tannery sludge.

Parameter	**Unit**	**Series T8**				**Series T12**				**Series T8-P**			
		pH 5.0	pH 7.0	pH 9.0	pH 11.0	pH 5.0	pH 7.0	pH 9.0	pH 11.0	pH 5.0	pH 7.0	pH 9.0	pH 11.0
SCFAs	g COD/L	7.15	7.19	7.34	7.26	15.35	14.84	13.92	14.97	23.76	26.20	26.09	25.74
$SCFAs/COD_{SOL}$	COD/COD	0.58	0.57	0.55	0.57	0.64	0.65	0.60	0.62	0.71	0.74	0.73	0.75
Y_F	$gCOD_{SCFA}/gVS_0$	0.12	0.12	0.12	0.12	0.17	0.17	0.16	0.17	0.28	0.31	0.30	0.29
Acetic acid	g COD/L	2.91	2.80	2.41	2.45	5.90	5.89	5.48	5.74	12.25	10.34	10.86	10.46
Propionic acid	g COD/L	1.06	1.09	1.06	1.04	2.02	2.15	2.46	2.02	3.38	4.30	4.01	3.45
Isobutyric acid	g COD/L	0.49	0.52	0.60	0.55	1.22	1.14	1.07	1.15	1.34	1.98	2.05	1.59
Butyric acid	g COD/L	1.73	1.71	2.01	2.10	3.90	3.48	2.92	3.96	4.23	6.34	5.65	6.97
Isovaleric acid	g COD/L	0.95	1.08	1.26	1.13	2.31	2.19	2.00	2.10	2.57	3.26	3.51	3.27
Valeric acid	g COD/L	-	-	-	-	-	-	-	-	-	-	-	-
COD_{SOL}	g COD/L	12.4	12.6	13.2	12.8	23.8	22.9	23.2	24.0	33.3	35.2	35.7	34.2
Alkalinity	g $CaCO_3$/L	2.70	2.72	2.72	2.70	2.77	2.74	2.76	2.74	2.89	2.93	2.87	2.86
$N\text{-}NH_4^+$	mg/L	880	725	810	741	1268	1284	1218	1131	1432	1569	1665	1679
$P\text{-}PO_4^{3-}$	mg/L	2.2	2.2	2.6	2.2	2.8	2.8	2.8	2.5	2.6	2.7	2.9	2.8
Chromium VI	mg/L	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03