FIGURE CAPTIONS

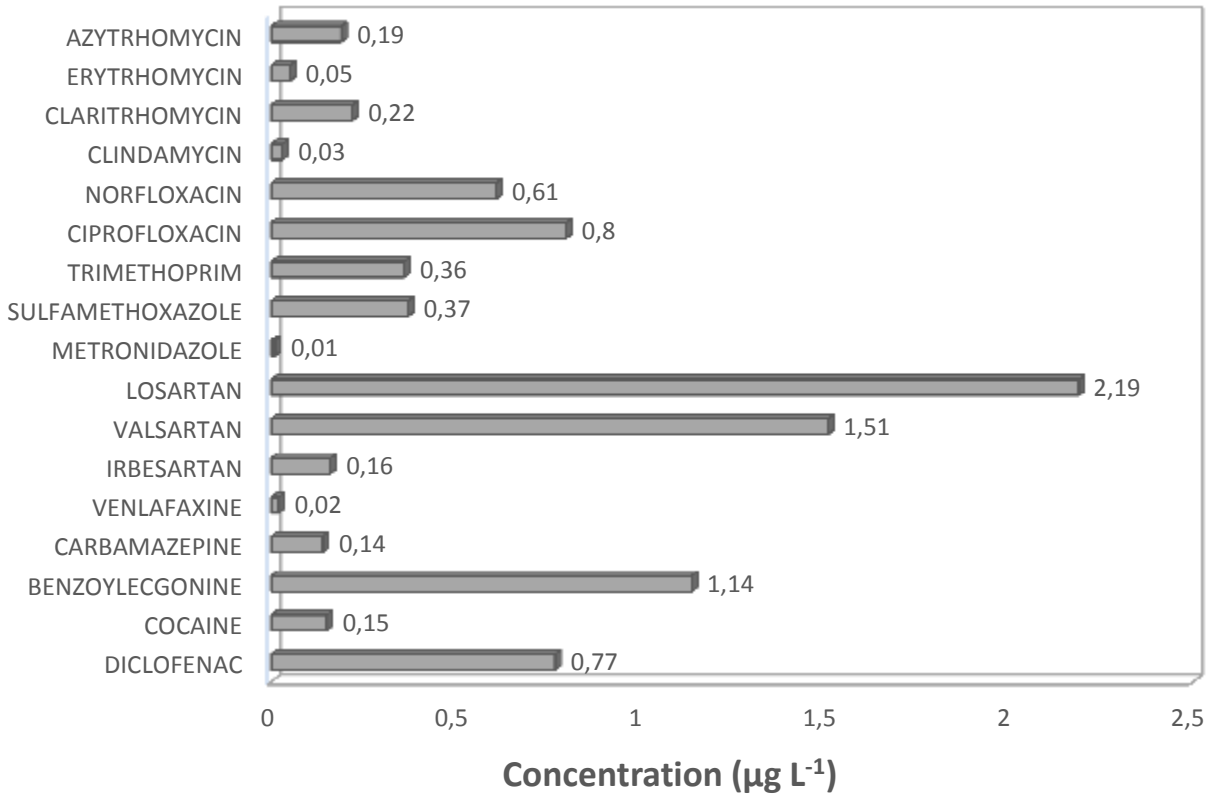


Figure 1. Pollutants presence in the effluents from El salitre MWTP.

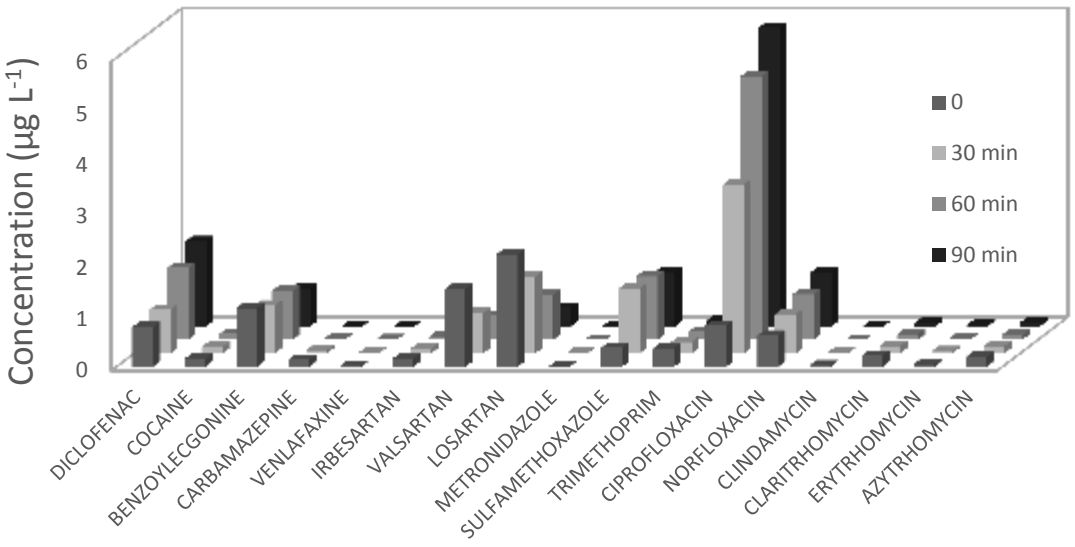


Figure 2. Pollutants evolution under ultrasound action. Concentration data in effluent wastewater along the time (0, 30, 60, 90m min). Conditions: Actual power density: 88.0 W L^{-1}, f: 375 kHz, V: 300 mL, $pH_{initial}$: 7.48.

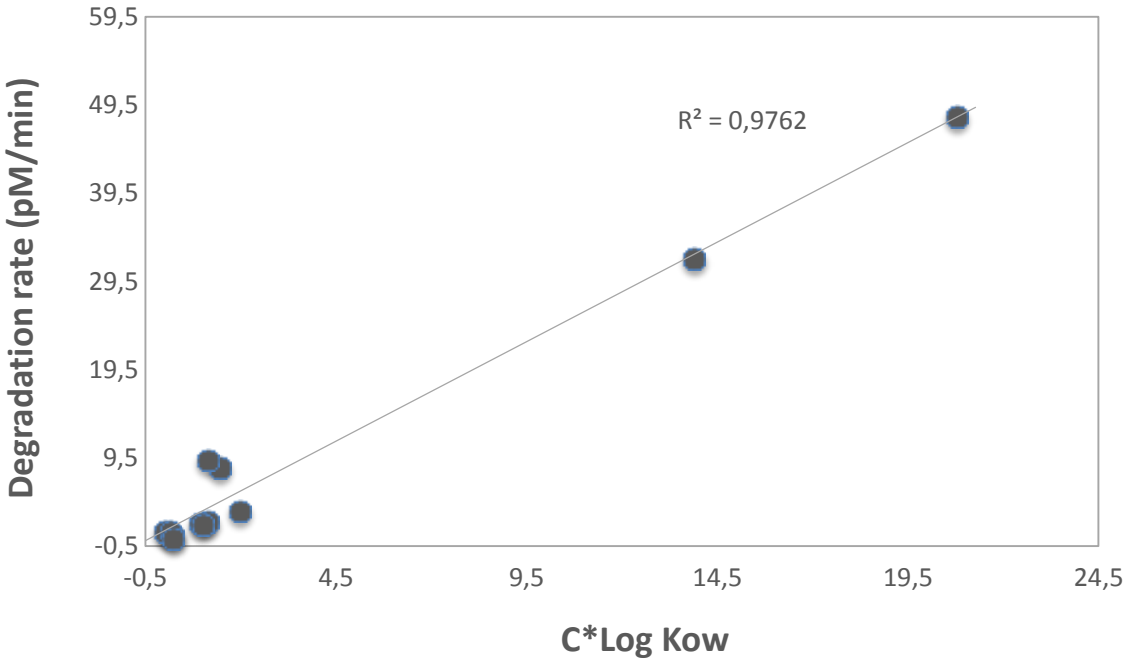


Figure 3. Correlation between pollutants degradation rate and the closeness to the cavitation bubble (denoted by the arithmetic multiplication between concentration and hydrophobicity (C*Log Kow)).

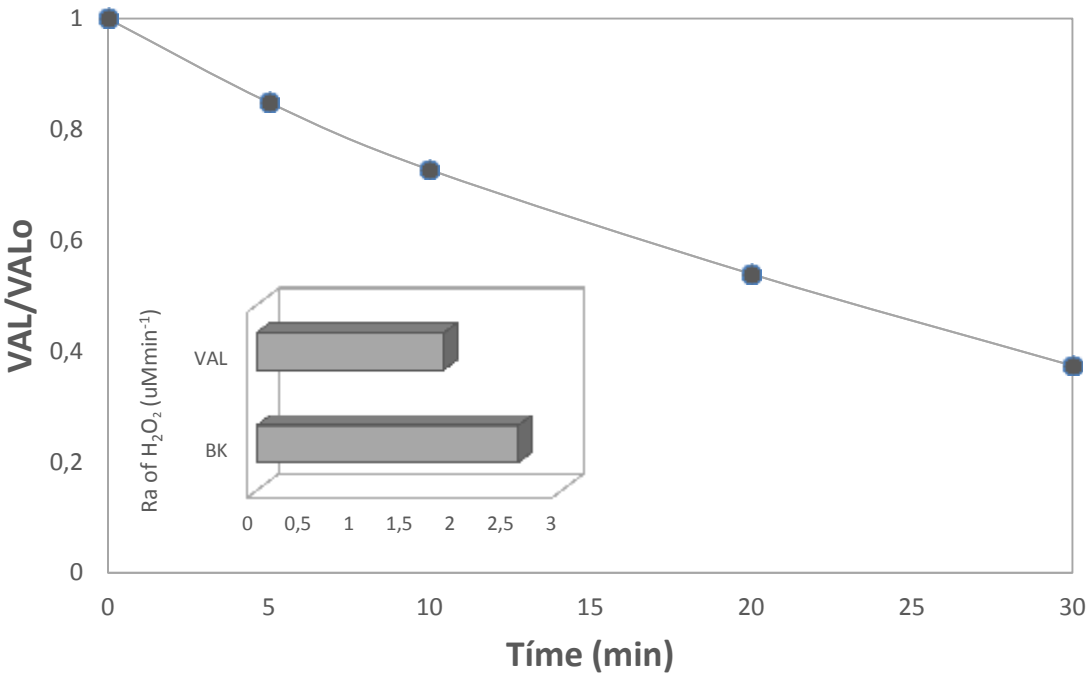
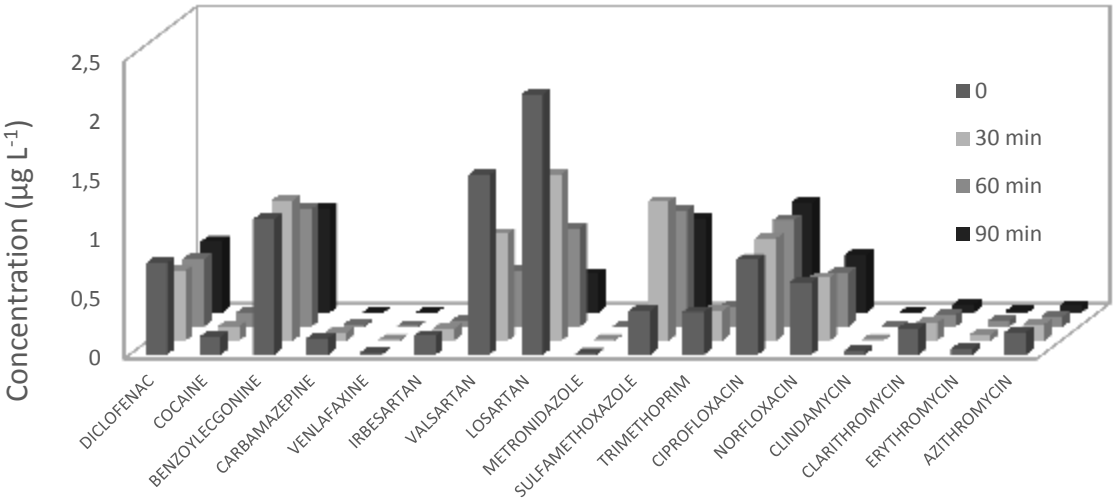
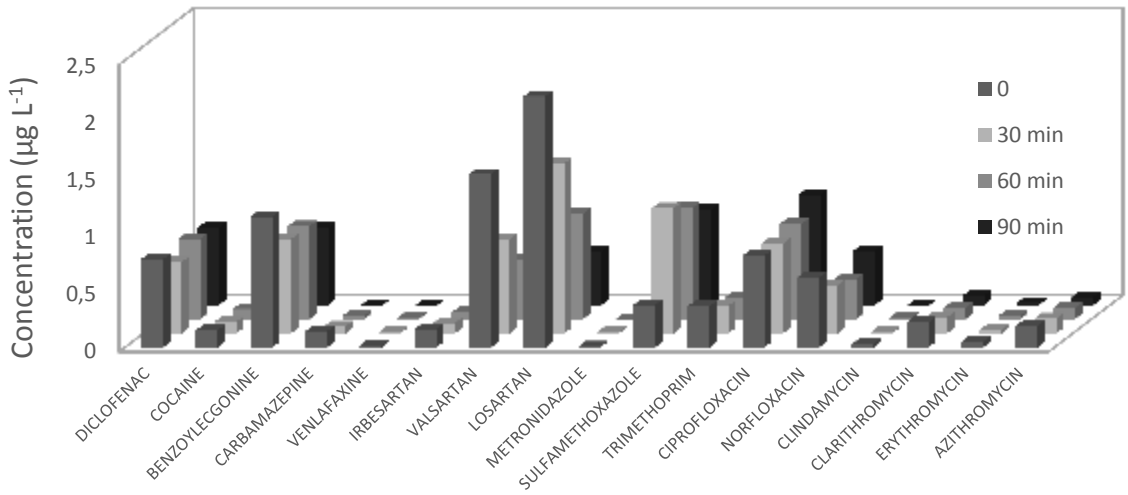


Figure 4. Sonochemical degradation of valsartan in distilled water. Conditions: Actual power density: 88.0 W L^{-1}, f: 375 kHz, V: 300 mL, [Valsartan]:40 µM, $pH_{initial}$: 6.5. Inset: rate of hydrogen peroxide accumulation (Ra); BK: absence of valsartan, VAL: presence of valsartan.

A


Concentration (µg L-1)
2,5
2
1,5
1
0,5
0
0
30 min
60 min
90 min
DICLOFENAC
COCAINE
BENZOYLECGONINE
CARBAMAZEPINE
VENLAFAXINE
IRBESARTAN
VALSARTAN
LOSARTAN
METRONIDAZOLE
SULFAMETHOXAZOLE
TRIMETHOPRIM
CIPROFLOXACIN
NORFLOXACIN
CLINDAMYCIN
CLARITHROMYCIN
ERYTHROMYCIN
AZITHROMYCIN

B


Concentration (µg L-1)
2,5
2
1,5
1
0,5
0
0
30 min
60 min
90 min
DICLOFENAC
COCAINE
BENZOYLECGONINE
CARBAMAZEPINE
VENLAFAXINE
IRBESARTAN
VALSARTAN
LOSARTAN
METRONIDAZOLE
SULFAMETHOXAZOLE
TRIMETHOPRIM
CIPROFLOXACIN
NORFLOXACIN
CLINDAMYCIN
CLARITHROMYCIN
ERYTHROMYCIN
AZITHROMYCIN

C

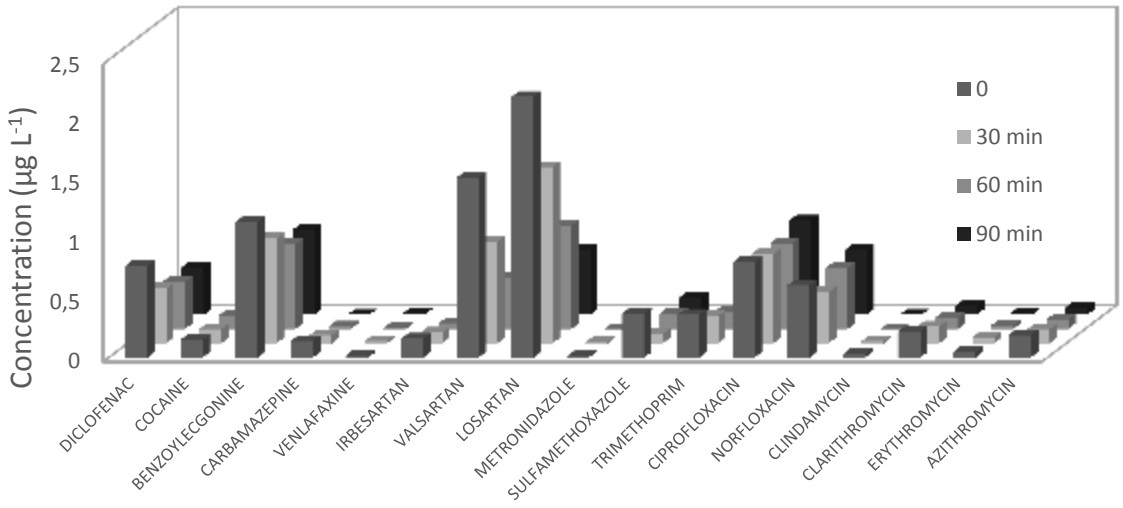
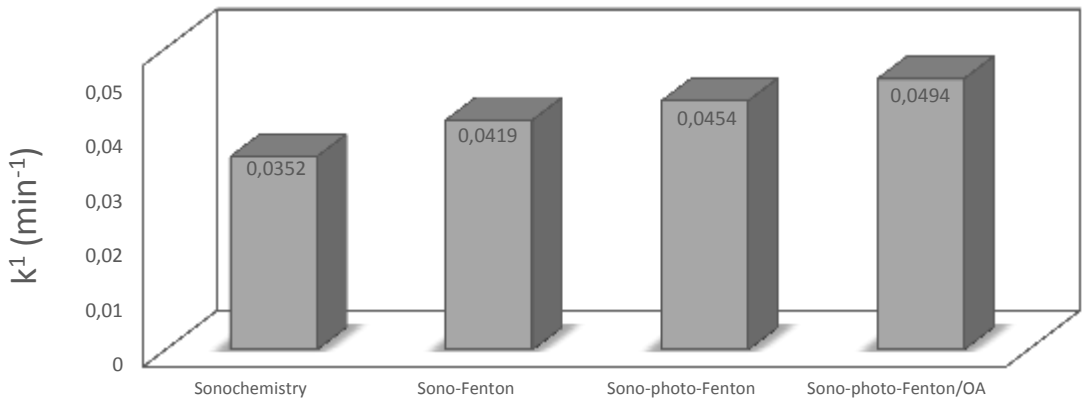


Figure 5. Effect of the combination of sonochemistry with photo-Fenton based systems on the degradation of emerging contaminants. **A)** Ultrasound combined with Fe^{2+} (sono-Fenton). **B**) Ultrasound combined with Fe^{2+} plus UV-A light (sono-photo-Fenton). **C**) Sono-photo-Fenton in presence of oxalic acid. Conditions: Actual power density: 88.0 W L^{-1}, f: 375 kHz, V: 300 mL, [Fe^{2+}]: 5 mg L^{-1}, [Oxalic acid]: 2 mg L^{-1}, $pH_{initial}$: 7.48.

A



B

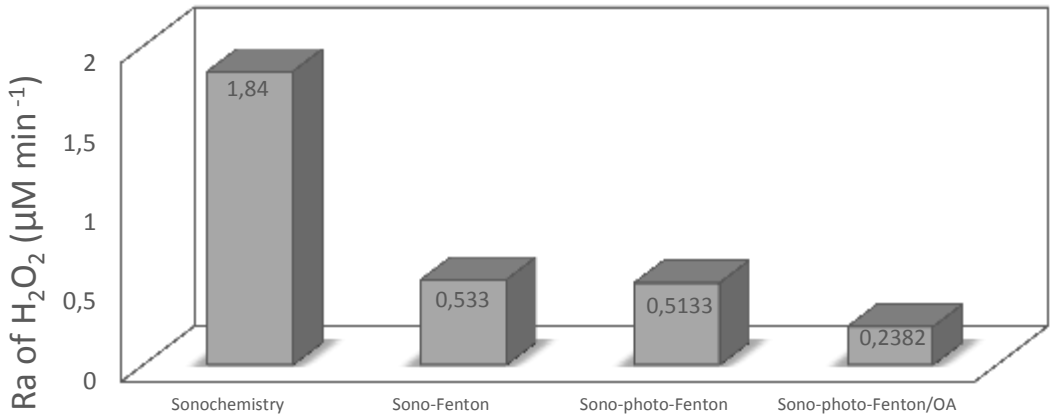


Figure 6. A. Comparison among the pseudo-first order rate constant (k^1) for valsartan (VAL) degradation by sonochemistry, sono-Fenton, sono-photo-Fenton and sono-photo-Fenton/oxalic acid systems (see control experiments in Figure SM4). **B.** Rate of hydrogen peroxide accumulation (Ra) for the different systems. Conditions: Actual power density: 88.0 W L^{-1}, f: 375 kHz, V: 300 mL, [Fe^{2+}]: 5 mg L^{-1}, [Oxalic acid]: 2 mg L^{-1}, $pH_{initial}$: 7.48.

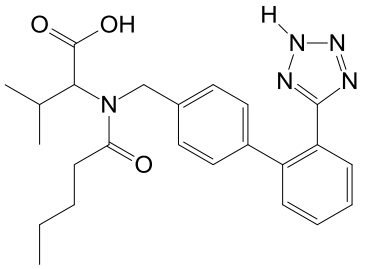
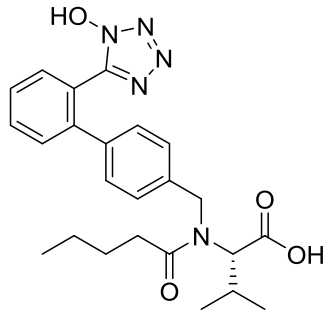
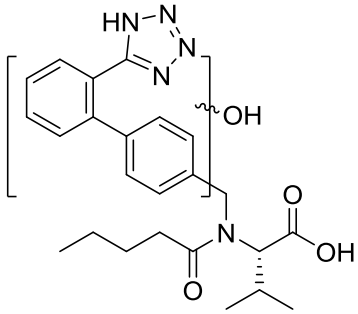
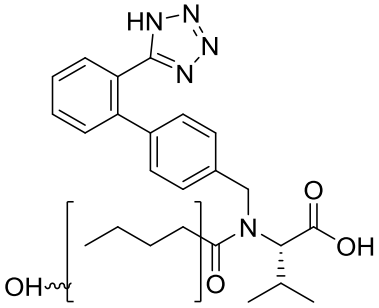
TABLE CAPTIONS

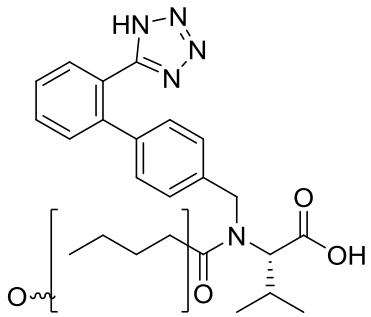
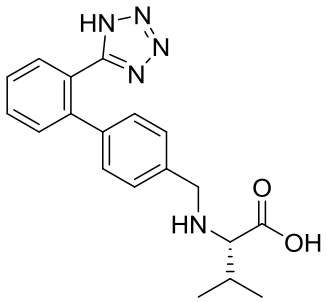
Table 1. Molar concentration, degradation rate and hydrophobicity of the pollutants.

Pollutant	Concentration (nM)	Degradation Rate (pM/min)	Log Kow
Diclofenac	2.60	(-)	4.51
Cocaine	0.49	2.31	2.30
Benzoylecgonine	3.94	13.83	-1.32
Carbamazepine	0.59	8.46	2.45
Venlafaxine*	0.07	0.72	3.20
Irbesartan	0.37	3.50	5.31
Valsartan	3.47	32.15	4.00
Losartan	5.18	48.24	4.01
Metronidazole*	0.06	1.17	-0.02
Sulfamethoxazole	1.46	(-)	0.89
Trimethoprim	1.24	9.30	0.91
Ciprofloxacin	2.41	(-)	0.28
Norfloxacin	1.91	(-)	0.46
Clindamycin*	0.07	1.18	2.16
Clarithromycin	0.29	2.14	3.16
Erythromycin*	0.07	0.41	3.06
Azithromycin	0.25	2.00	4.02

*For those pollutants with initial concentrations lower than 0.1 nM (close to the limits of quantification) the degradation rates were found to have high uncertainly, which impeded the hydrophobicity comparison among such substances. (–): As the sonochemical action increased the concentration of these compounds, their degradation rates was not calculated. The degradation rate has units of pico-Molar per minute (pM/min).

Table 2. Proposed primary degradation products of ultrasonic treatment of valsartan*.

Substance	Proposed chemical structure	Short description
Valsartan		Parent pollutant
DP1		Product of tetrazole hydroxylation
DP2		Product of biphenyl hydroxylation
DP3		Product of pentanamide hydroxylation

DP4		Product of pentanamide oxidation
DP5		Product of pentanamide rupture

*More details about the degradation products are provided in Figures SM6-SM12.

Table 3. Compared pollutants removals by ultrasound and combined processes*.

Pollutant	SYSTEM							
	sonochemistry		Sono-Fenton		Sono-photo-Fenton		Sono-photo-Fenton/oxalic acid	
	PD (%)	RA (ng)	PD (%)	RA (ng)	PD (%)	RA (ng)	PD (%)	RA (ng)
Diclofenac	-114.29	-264	22.08	51	12.99	30	48.05	111
Cocaine	46.67	21	40.00	18	53.33	24	33.33	15
Benzoylecgonine	35.96	123	22.81	78	41.23	141	37.72	129
Carbamazepine	100.00	42	100.00	42	100.00	42	100.00	42
Venlafaxine	100.00	6	100.00	6	100.00	6	50.00	3
Irbesartan	87.50	42	87.50	42	81.25	39	81.25	39
Valsartan	86.09	390	86.75	393	83.44	378	79.47	360
Losartan	83.56	549	84.93	558	78.54	516	74.89	492
Metronidazole	100.00	3	100.00	3	100.00	3	100.00	3
Sulfamethoxazole	-183.78	-204	-113.51	-126	-124.32	-138	62.16	69
Trimethoprim	69.44	75	69.44	75	66.67	72	63.89	69
Ciprofloxacin	-625.00	-1500	-16.25	-39	-20.00	-48	1.25	3
Norfloxacin	-72.13	-132	19.67	36	22.95	42	11.48	21
Clindamycin	100.00	9	100.00	9	100.00	9	100.00	9
Clarithromycin	68.18	45	68.18	45	63.64	42	68.18	45
Erythromycin	40.00	6	60.00	9	60.00	9	80.00	12
Azithromycin	68.42	39	68.42	39	63.16	36	68.42	39
Total summation	**-9.37**	**-750**	**900.03**	**1239**	**882.87**	**1203**	**1060.09**	**1461**
Average	**-0.55**	**-44.1**	**52.94**	**72.9**	**51.93**	**70.8**	**62.36**	**85.9**
Pondered elimination (%)	***-28.67***		***47.36***		***45.99***		***55.85***	

*PD and RA were calculated at 90 min of treatment. Negative values of PD and RA indicate the system is concentrating the pollutant.