Electronic Supplementary Material (ESI) for Reaction Chemistry & Engineering.

Soybean peroxidase immobilised on cellulose-alginate hydrogels for removal of recalcitrant organic pollutants in water: supplementary information

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Fig. S1: Results of 10 consecutive activity tests with colorimetric DMAB/MBTH/H_2O_2 method

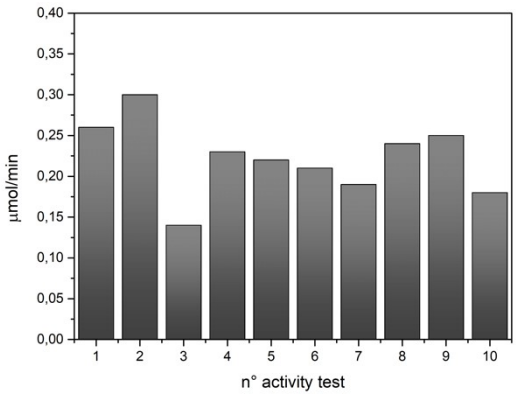


***Fig. S1**: Results of 10 consecutives activity tests of one HY-AC-SBP with DMAB/MBTH/H_2O_2 colorimetric method expressed in µmol/min of formed purple product*

Fig. S2: Contribution to abatement % of H_2O_2 only (initial concentration of 1×10^{-4} M) in ultrapure water

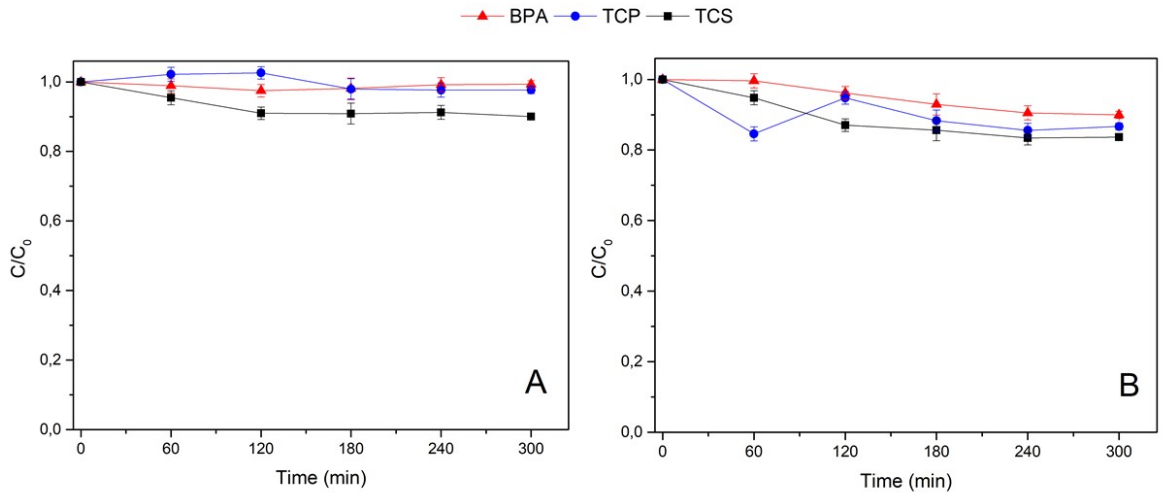


***Fig. S2**. (A) Single contaminant solutions abatement related to H_2O_2 10^{-4}M in ultrapure water; (B) contaminants mixture solution abatement related to H_2O_2 10^{-4}M in ultrapure water*

Fig. S3: Adsorption of BPA, TCP and TCS with HY-AC-SBP hydrogels

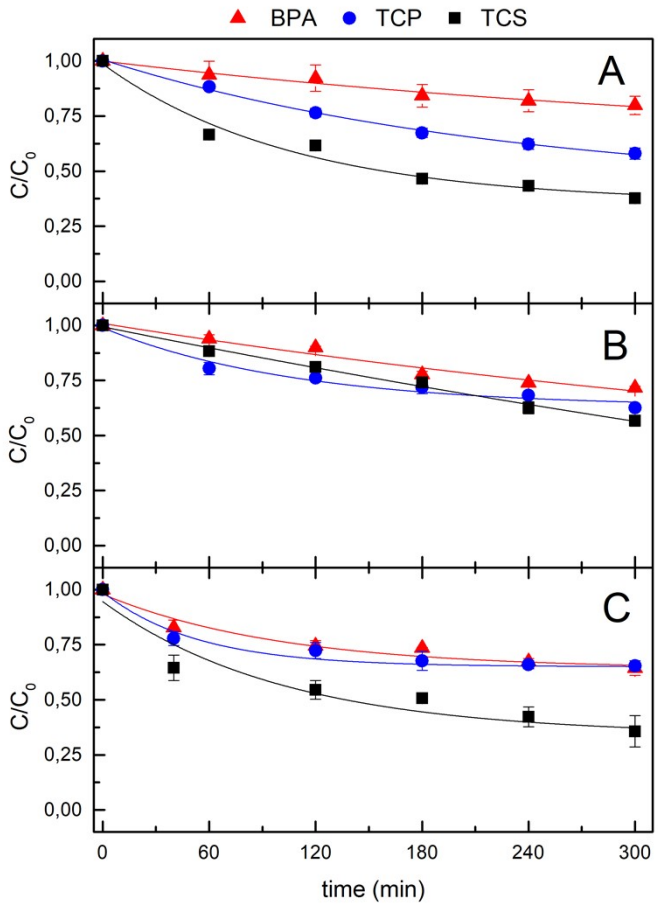
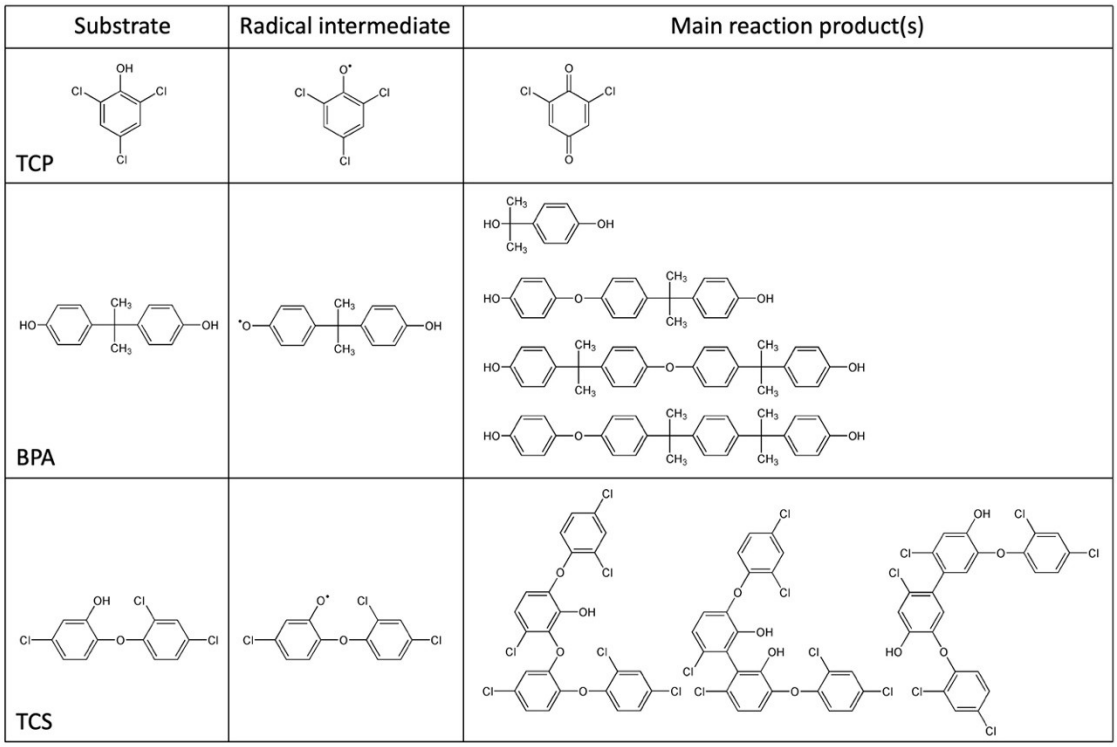


Fig.S3*: (A) Adsorption of single contaminant solutions in ultrapure water; (B) Adsorption of contaminants mixture in ultrapure water; (C) Adsorption of contaminants mixture in real water (pond water)*

Fig S4: Diagram summarizing the radical intermediates generated during the SBP reaction cycle and the main reaction products.



Data taken from the following references:

- R. P. Ferrari, E. Laurenti and F. Trotta, *J Biol Inorg Chem*, 1999, **4**, 232–237.
- K. E. Hammel and P. J. Tardone, *Biochemistry*, 1988, **27**, 6563–6568.
- J. Li, J. Peng, Y. Zhang, Y. Ji, H. Shi, L. Mao and S. Gao, *Journal of Hazardous Materials*, 2016, **310**, 152–160.
- Q. Huang and W. J. Weber, *Environ. Sci. Technol.*, 2005, **39**, 6029–6036.

Fig S5: Enzymatic removal of BPA, TCP and TCS with free SBP in single and mixture ultrapure water solutions

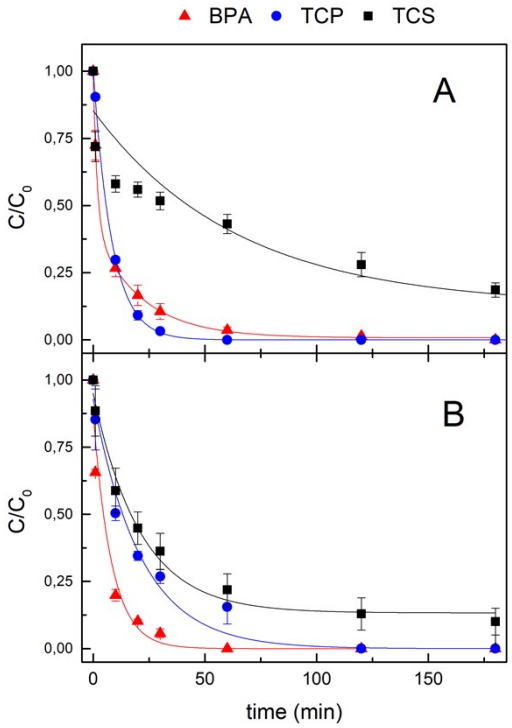


Fig. S5*: (A) Enzymatic removal results of single contaminant ultrapure water solutions with free SBP; (B) Enzymatic removal results of contaminants mixture ultrapure water solution.*

Fig S6: Additional analysis on TCP

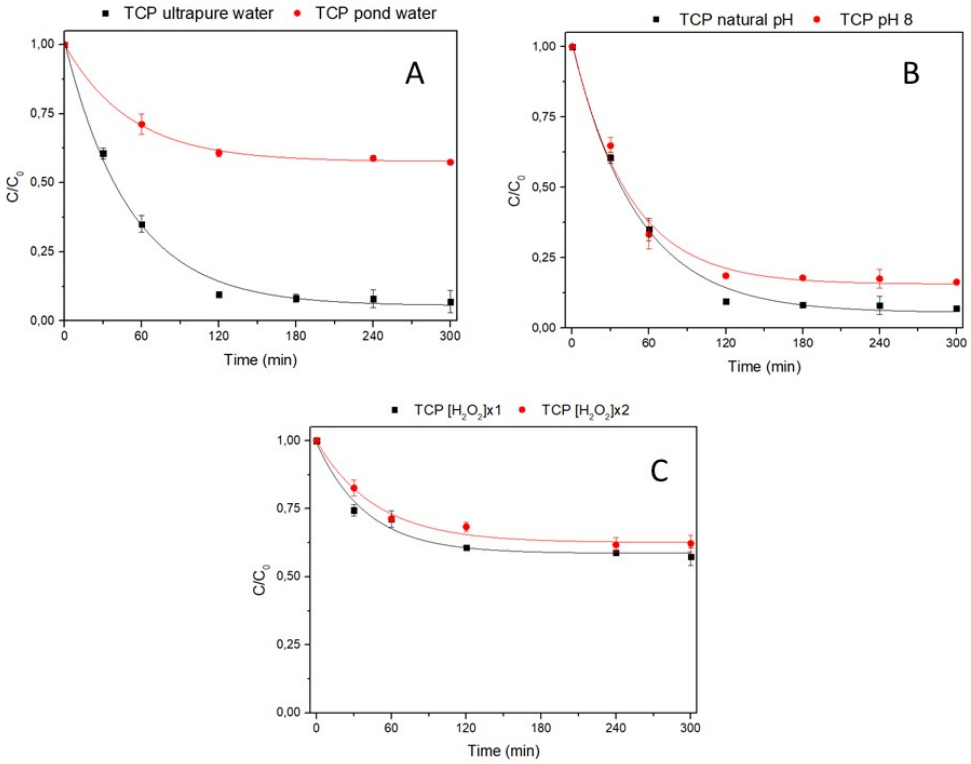


***Fig. S6**: (A) comparison between enzymatic removal of TCP in ultrapure water and pond water with HY-AC-SBP hydrogels; (B) comparison between enzymatic removal of TCP in ultrapure water at natural pH and pH 8 with HY-AC-SBP hydrogels; (C) comparison between enzymatic removal of TCP in pond water with HY-AC-SBP hydrogels using a normal (10^{-4} M) and double ($2x10^{-4}$M) concentration of H_2O_2.*

Fig. S7: Eighth cycle removal trend with the same HY-AC-SBP hydrogels

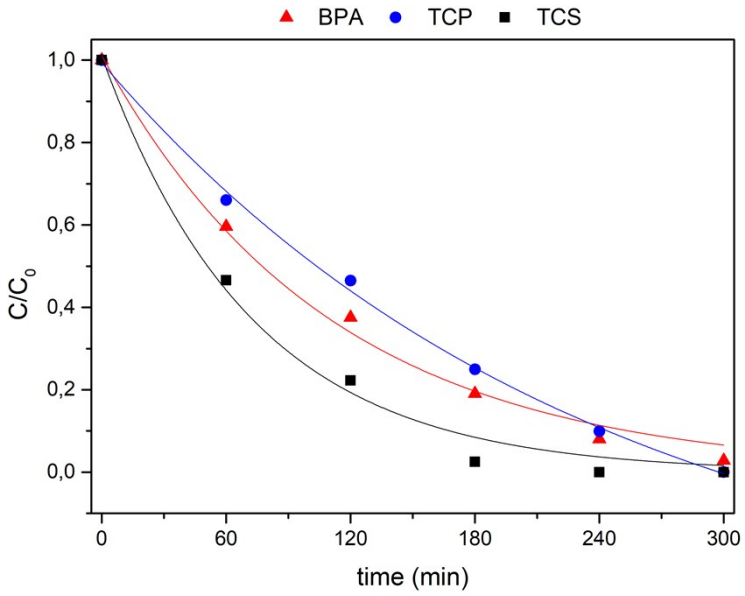


***Fig. S7**: Removal of BPA, TCP and TCS in the eighth reaction cycle with the same HY-AC-SBP hydrogels*

Table S1: k_{obs} and half-time values for the first and eighth reaction cycles with HY-AC-SBP

Contaminant	**First cycle**		**Eighth cycle**	
	k_{obs} first cycle	**$t_{1/2}$ first cycle**	**k_{obs} eighth cycle**	**$t_{1/2}$ eighth cycle**
BPA	0,015±0,001	46±4	0,009±4,15x10^{-4}	76±3,5
TCP	0,037±0,001	19±0,3	0,0082±8x10^{-4}	84,4±8
TCS	0,027±0,001	26±1,2	0,0138±9,2x10^{-4}	50,2±3,35