

### ISTA18-990169 - FOUR YEARS OF ESTROGENIC ACTIVITY ASSESSMENT IN SURFACE WATERS OF SÃO PAULO STATE, BRAZIL

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Endocrine disrupting chemicals (EDCs) have the ability to alter the endocrine system of organisms. Such compounds are present in several industrial and domestic activities and reach the aquatic environment via wastewater discharges or agricultural surface runoff. The aim of this study was to determine the overall estrogenic activity of surface waters of São Paulo State, Brazil. For this purpose, 10 sites from the routine Surface Water Quality Program of CETESB were selected that were already surveyed for physical, chemical and biological variables from 2013 to 2016. Samples were extracted in solid phase and tested for estrogenic activity using bioluminescent yeast estrogen assay (BLYES). Results were expressed in 17-estradiol equivalent quotient (EEQ). Estrogenic activity was below the limit of quantification (0.1 EEQ) in 31.7% of 227 samples. All sites presented estrogenic activity at least once. The results have shown the presence of estrogenic activity in a range from 0.11 to 26.6 EEQ in the sampling sites in four years of study. Statistical analysis showed a positive correlation between estrogenic activity and the biochemical oxygen demand performed in the samples, indicating that this activity detected in most sites is related to wastewater discharges. Due to the presence of estrogenicity higher than 5.0 EEQ in a few sampling sites, further chemical analyses and other bioassays are recommended in order to provide a better understanding of the estrogenic activity present at these sites.

### ISTA18-990170 - REMOVAL OF AN AZO DYE USING FENTON AND FENTON-LIKE PROCESSES: EVALUATION OF THE PROCESS FACTORS BY BOX-BENHKEN DESIGN AND ECOTOXICITY TESTS

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The conventional treatment of textile effluents is usually not effective to remove azo dyes and can still generate products more toxic than the original dyes. The present study evaluated the effects of the process factors on the removal efficiency of Disperse Red 343 (DR343) azo dye by Fenton processes. The effects of iron and H<sub>2</sub>O<sub>2</sub> concentrations, pH, and time on dye removal and residual H<sub>2</sub>O<sub>2</sub> were evaluated using a Box-Benkhken Design. Additionally, the ecotoxicity of the treated samples was analyzed on different organisms (lettuce seed, *Artemia salina*, and zebrafish early-life stages). Dye removal was assessed by spectrophotometry and it was only affected by iron concentration in both Fenton and Fenton-like processes with positive linear and quadratic effects (removal: 5.8% - 100%). Similarly, residual H<sub>2</sub>O<sub>2</sub> was decreased with an increase in iron concentration, whereas the initial H<sub>2</sub>O<sub>2</sub> concentration had the opposite effect. At the end of the process residual H<sub>2</sub>O<sub>2</sub> was in the range from 0% to 7.4%. No significant phytotoxic effect was observed after the treatments. In turn, the treatment time had significant effect on *A. salina* mortality in Fenton process, showing a quadratic effect, which suggests the formation of toxic oxidation by-products at the beginning of the process followed probably by total mineralization. The samples obtained using the best treatment conditions did not induce lethal or sublethal effects to zebrafish early-life stage. Therefore, Fenton and Fenton-like processes can be successfully used to remove DR 343 dye from water, but the effects of the different process factors on toxicity should be analyzed.