

Degradation kinetics of emerging organic contaminants subjected to electro- and photo-degradation

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Emerging organic contaminants are increasingly being released into the environment, raising concerns for environmental quality and human health. These compounds, corresponding to contaminants which have not been regulated yet, may belong to several categories, including endocrine disrupting compounds (EDCs) and/or pharmaceutical and personal care products (PPCPs). The effluents from wastewater treatment plants (WWTPs) are major sources of surface water contamination by EDCs/PPCPs. Hundreds of tons of these kinds of substances enter WWTPs each year, not being completely degraded by conventional processes commonly employed. Therefore, it becomes necessary to adopt more advanced processes aiming to increase contaminants removal.

In recent years, electrochemical technology has received great attention for the prevention of pollution problems. Electrokinetics can be used to manipulate the chemistry of the matrices through electrolysis to create conditions favourable for either reduction or oxidation of the contaminants.

This work aims to assess the behaviour of some selected emergent contaminants when subjected to the electrokinetic process, by evaluating the yield of degradation (aiming to achieve a complete mineralization) under different conditions.

The main parameters under study were (i) current density (ii) presence of UV light. Initially degradation kinetics was studied for each compound alone and in a mixed solution.

The compounds under study were: Benzophenone-3, Bisphenol A, Diclofenac, Ethinylestradiol, all known to be endocrine disrupting agents.

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