

Electrokinetic technology applied to PPCPs removal from effluent - feasibility assessment

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The pharmaceutical and personal care products (PPCPs) are emerging organic contaminants which might pose potential hazards to environment and health. PPCPs are not effectively removed by conventional wastewater treatment plants (WWTPs) and, consequently, they may be present in the effluent. The reuse of effluent provides the key to an effective alternative to limited water resources. In this sense, the removal of PPCPs from effluent is needed to reduce environmental and public health associated risks.

The wide range of chemical properties of PPCPs constraints the development of an universal technology. The goal of this study is to optimize and validate an electrokinetic (EK) technology to remove PPCPs from effluent, aiming its safe reuse in agriculture. Having in mind previously results obtained by the team, the EK parameters that are being optimized in a 1C-cell design are: current density and time. The target PPCPs are: a) pharmaceutical highly reported in Portuguese effluents and aquatic water bodies, synthetic estrogen (ethinylestradiol), and b) personal care compounds also present in the same matrix: plasticiser (bisphenol A), UV filter (oxybenzophenone). The PPCPs have different physical and chemical characteristics between them.

The analytical methodology is being optimized through solid phase extraction (SPE) and quantification through high pressure liquid chromatography (HPLC) and multi-detection by DAD and fluorescence.

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