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Removal of a cytostatic drug by a membrane bioreactor

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ABSTRACT

The application of membrane bioreactor process is investigated in the aim of evaluating the potential for removal of cyclophosphamide (CP). Two laboratory-scale membrane bioreactors (MBR) were run in parallel, one with CP and its principal metabolites (MBR1-CPs), and one without (MBR2-control). Removal of CP in an MBR and its effects on the membrane performance, chemical oxygen demand (COD) and total nitrogen (TN) removal efficiency were studied. Removals of 80% were achieved for CP and the metabolite 4-ketocyclophosphamide under the operating conditions studied. Both adsorption and degradation affect the overall removal. The toxicity of CP and its metabolites does not alter the COD or TN removal efficiency of MBR. However, it induces a modification of the biological suspended solids and so a modification of the membrane fouling.

Keywords: Cyclophosphamide; Membrane bioreactor; Micropollutants; Wastewater

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