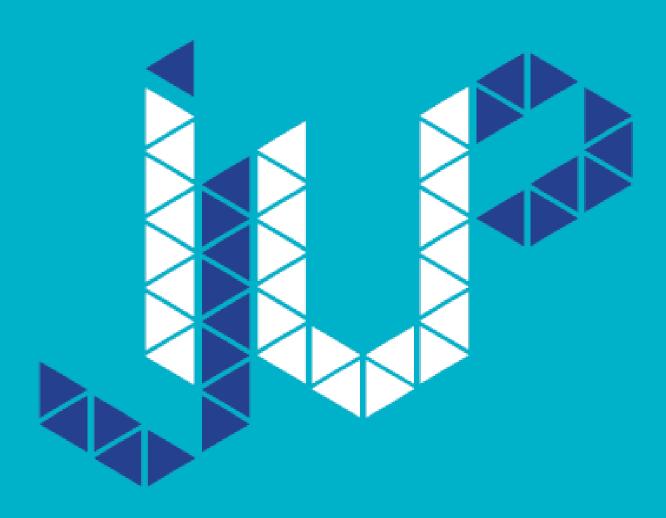
BOOK OF ABSTRACTS

8TH MEETING OF YOUNG RESEARCHERS OF UNIVERSITY OF PORTO





Biosorption of fluoroquinolones by activated sludge and aerobic granules sludge

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Antibiotic residues have been detected in various environmental matrices, such as surface water and even drinking water. Although present at low levels (µg/L, ng/L), many antibiotics are bioaccumulative, pseudo-persistent and can promote resistance/alterations in bacterial populations [1]. Recent studies on antibiotics removal by activated sludge (AS) and aerobic granules (AGS) show biosorption as the dominant process, determining the fate of these micropollutants [2-3].

In this work the biosorption of three widely used fluoroquinolones (FQ) - ofloxacin (OFL), norfloxacin (NOR) and ciprofloxacin (CPF) - to AS and AGS was evaluated. A High Performance Liquid Chromatography with Fluorescence Detection (HPLC-FD) method was validated and used to follow the biosorption of the target FQ.

Data obtained in this study contribute to a better comprehension of FQ biosorption behavior in AS and AGS. At pH 7 AS showed better performance to biosorb OFL, NOR and CPF than AGS. The higher biosortion capacity of AS was probably due to the negative charge on its surface, evaluated by a zeta potential of -25.65 mV, at pH 7. OFL was the less biosorbed, both onto AS and AGS, because this FQ at pH 7 is mainly present in its anionic form. The equilibrium data for AS showed a better fit to the Langmuir model, while the model that presented better fit for AGS was the Freundlich model. The FQ could be desorbed from AGS at pH 3, pH 8 and pH 9 whereas at pH 4 the biosorption process was promoted.

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