

CO21. Quantification of several *beta*-blockers and fluoxetine in biodegradation assays by chiral HPLC-FD

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Chiral pharmaceuticals are a group of persistent pollutants of great concern due to the fate and effects of their enantiomers in the environment, which are still largely unknown. Their biodegradation tends to be enantioselective in contrast to abiotic degradation however the developed methods to quantify the enantiomeric fraction in the environment and to follow biodegradation are scarce [1]. This work describes the validation of HPLC methods with fluorescence detection that allow the enantiomeric fraction quantification of four *beta*-blockers (alprenolol, propranolol, metoprolol, and atenolol) and the antidepressant fluoxetine. The macrocyclic antibiotic vancomycin CSP (ASTEC Chirobiotic V 5µm) was used under polar ionic mode. The biodegradation assays were performed during 15 days in batch mode, using activated sludge from the aerated tanks of a municipal WWTP. The assays were performed at initial concentrations of 10 and 1ppm for single compound supplementation and at 5 and 0,5ppm for supplementation of a mixture of compounds, in the presence and absence of sodium acetate. Abiotic degradation in light and dark conditions was also evaluated. The results indicate the higher degradation extents for the *S*-enantiomer, as shown in Fig. 1.

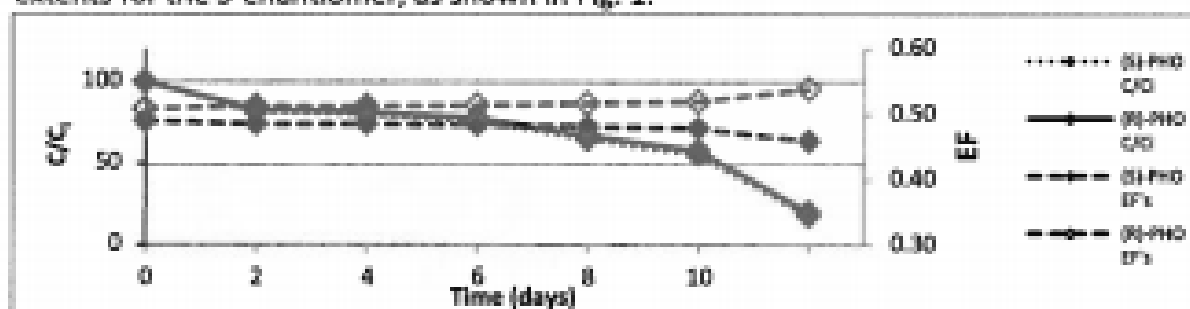


Figure 1. Removal (C/C₀) and Enantiomeric Fraction (EF) of *S*- and *R*-enantiomers of propranolol when inoculated with activated sludge in the presence of sodium acetate.

[1] NH Hashim, S Shafie and SJ Khan, Environ Technol, 2010, 31(12) 1349-1370