Pharmaceutical biological degradation, sorption and mass balance determination in a conventional activated-sludge wastewater treatment plant from Murcia, Spain

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Abstract

Pharmaceutical compounds are being detected widely in the aquatic environment due to their global consumption. Some ecotoxicological studies have revealed their implication in different toxic effects and the only mechanism available nowadays to combat with this problem are the wastewater treatment plants, which in function of the system employed seem to be more successful in the pharmaceuticals degradation. The contribution of adsorption and bio-degradation to the overall removal was estimated to be the main reason for their elimination from the environment. For that reason, in this paper the biological degradation, sorption and mass balance in a conventional activate sludge (CAS) WWTP are evaluated. Among of the pharmaceutical studied (carbamazepine, diclofenac, ibuprofen, ketoprofen and naproxen), the most of them (except carbamazepine), had an extraordinary degradation (>80%). The percentages of the elimination due to microorganism degradation in the secondary treatment, was estimated for all of the pharmaceutical and it was observed that it was very important