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Removal of ozonation products of pharmaceuticals in laboratory Moving Bed Biofilm Reactors (MBBRs)

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Highlights

- MBBRs were used to remove ozonation products from effluent waste water.
- MBBRs removed macrolide antibiotics and diclofenac ozonation products at realistic concentrations.
- Most of the compounds were removed quantitatively after 50 h batch operation.
- The reaction kinetics and reaction rate constant were concentration dependent.
- The ozonation products of the macrolides were not back transformed into their parents

Abstract

The major pathway of pharmaceuticals from urban applications to urban surface waters is via wastewater treatment plants. Ozonation is able to remove pharmaceuticals from wastewater effluents. However, during that reaction ozonation products are formed. Some ozonation products were found to be persistent and have adverse effect on the environment. Moving bed bio reactors (MBBRs) were tested for the removal of the ozonation products of macrolide antibiotics and diclofenac at two different concentration levels 1 µg/L and 10 µg/L in laboratory reactors. It was found that the MBBRs are capable of degrading these compounds without back-transformation into