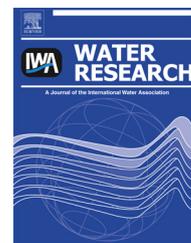


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Dissolved organic nitrogen and its biodegradable portion in a water treatment plant with ozone oxidation

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ABSTRACT

Biodegradability of dissolved organic nitrogen (DON) has been studied in wastewater, freshwater and marine water but not in drinking water. Presence of biodegradable DON (BDON) in water prior to and after chlorination may promote formation of nitrogenous disinfectant by-products and growth of microorganisms in the distribution system. In this study, an existing bioassay to determine BDON in wastewater was adapted and optimized, and its application was tested on samples from four treatment stages of a water treatment plant including ozonation and biologically active filtration. The optimized bioassay was able to detect BDON in 50 $\mu\text{g L}^{-1}$ as N of glycine and glutamic solutions. BDON in raw (144–275 $\mu\text{g L}^{-1}$ as N), softened (59–226 $\mu\text{g L}^{-1}$ as N), ozonated (190–254 $\mu\text{g L}^{-1}$ as N), and biologically filtered (17–103 $\mu\text{g L}^{-1}$ as N) water samples varied over a sampling period of 2 years. The plant on average removed 30% of DON and 68% of BDON. Ozonation played a major role in increasing the amount of BDON (31%) and biologically active filtration removed 71% of BDON in ozonated water.

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