

Optimization of Ozone Disinfection Systems with Fluorescent-Dyed Microspheres

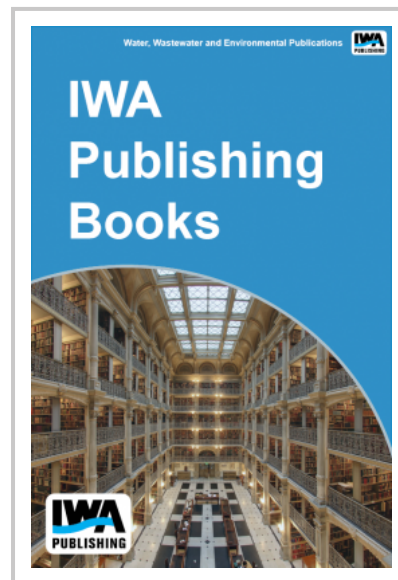
The operation of ozone contactors needs to be optimized to provide adequate disinfection while minimizing the formation of disinfection by-products. However, measuring the actual disinfection efficiency is impractical in a full-scale system.

The objective of this project was to demonstrate the use of polystyrene microspheres to assess and optimize the performance of full-scale ozone disinfection systems. Specifically, the researchers developed and optimized microspheres with laboratory-scale experiments, demonstrated the use of microsphere method with a full-scale ozone contactor, and applied a mathematical model for the prediction of disinfection efficiency and bromate formation in the full-scale ozone contactor.

This study has shown that microspheres can be used as a surrogate for assessing the inactivation efficiency of *C. parvum* oocysts in ozone contactors. It is therefore recommended that water utilities using ozone as disinfectant consider performing such tests. This study has also shown that a mathematical model could be used to predict the performance of the contactor. Mathematical simulation revealed that reducing dispersion would result in more disinfection with minimal effect on bromate formation.

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