



Removal of viruses and disinfection by-products at two drinking water treatment plants in southern China

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ABSTRACT

The removal of viruses and disinfection by-products (DBPs) at two water plants (A and B) in a city of southern China was investigated. Coliphages MS2 and Phix174 were used as indicators of viruses. The results clearly indicated that the removal efficiency of MS2 and Phix174 was over 99% by conventional coagulation/sedimentation with polyaluminium sulfate chloride (PACS) at Plants A and B. MS2 and Phix174 were not detected in the effluent of these two plants. However, the removal efficiency of UV₂₅₄ and TOC by coagulation/sedimentation was only 22.05% and 64.57% at Plant A, and 17.64% and 11.89% at Plant B, respectively. The species and amount of DBPs and their formation potential had no significant decrease after coagulation/sedimentation. In biological filtration, UV₂₅₄ and TOC could be removed 6.62% and 24.50%, respectively. However, more soluble microbial products (SMP) and extracellular polymeric substances (EPS), the precursors of DBPs, were produced. Granular activated carbon (GAC) was efficient in the removal of UV₂₅₄ and TOC, with an efficiency of 16.18% and 14.85%, respectively. Sand filtration, the final process, performed poorly in removing viruses and DBPs precursors. Both the processes of Plants A and B were not efficient in the removal of DBPs and their precursors.

Keywords: Drinking water; Viruses; Disinfection by-products (DBPs); Removal efficiency; Water plants; Southern China

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