

Simultaneous removal of particles and dissolved organic matter in floating media filter for surface water treatment

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ABSTRACT

This research investigated the performance of floating media filter in removing particles and dissolved organic matter from surface water. Pilot-scale study consists of floating plastic media pre-filter connected with either granular activated carbon (GAC) or sponge biological filter (BF) bed. In the floating plastic media filter, coagulation and flocculation processes using poly-aluminum chloride (PACl) as coagulant at an optimum dose of 8 mg/L helped removing particles from raw water. The floating media filter was operated a filtration rate of 11 m³/m².h whereas those in GAC and BF units were maintained at 2 m³/m².h. Continuous operation for over 120 days gave 98% and 99% average removal efficiencies of turbidity and UV₂₅₄ in floating media filter in combination with GAC unit whereas and 78% and 52% removal efficiencies of turbidity and UV₂₅₄ removal were obtained in floating media filter in combination with BF. The removal of dissolved organic carbon in GAC and BF units reduced chlorine demand for disinfection by 29% and 14%. It could also reduce the sum of trihalomethane (THMs) ratio from 1.1 to 0.1 and 0.5 respectively.

Keywords: Biological filter; Floating media; Granular activated carbon; Natural organic matter; Water treatment

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