

Coagulation–microfiltration for lake water purification using ceramic membranes

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ABSTRACT

A microfiltration process coupled with online coagulation using honeycomb ceramic membranes was used to purify lake water. The turbidity of feed lake water was from 13 to 30 NTU and the suitable dose of the coagulant was 15–30 mg L⁻¹ by the jar test. The turbidity of the treated lake water after coagulation was about 5 NTU, which was suitable for microfiltration at the optimised operating conditions of 0.2 MPa and 1 m·s⁻¹. The function of flux as membrane pore size showed that the optimal pore size was 500 nm in the tested four ceramic membranes for treating the lake water. The steady flux of microfiltration increased from 225 to 640 L·m⁻²·h⁻¹ by coupled with online coagulation, and the turbidity removal increased from 97.2% to 99.5%. The water quality analysis displayed that UV₂₅₄, the content of TOC and metal ions by microfiltration with online coagulation were lower than that without coagulation.

Keywords: Microfiltration; Coagulation; Lake water; Ceramic membrane

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