

Removal of natural organic matter (NOM) by the coagulation–ultrafiltration system using an inorganic–organic composite coagulant

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ABSTRACT

A coagulation–ultrafiltration system to treat drinking water has been widely studied. This study investigated the feasibility and potential of using inorganic-organic composite coagulant in the coagulation-ultrafiltration system for natural organic matter (NOM) removal. The removal efficiency and membrane fouling were studied at different coagulation conditions. And in order to observe how inorganic-organic composite coagulant affects the permeate flux, a resistance analysis was conducted. The results suggest that although the treated water quality in a composite coagulant system was not improved significantly, composite coagulant was more advantageous in terms of improving the permeate flux of the coagulation–ultrafiltration system than inorganic coagulant by reducing the resistance due to cake formation and adsorption. The coagulation conditions of composite coagulant are important for the performance of the coagulation–ultrafiltration system. When dosage is 3 mg L⁻¹ and pH is 6, the removal efficiency and the permeate flux are the highest in our study.

Keywords: Composite coagulant; Ultrafiltration; Humic acid; Membrane fouling; Resistance

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