



Identification of the fouling-caused foulants with different pretreatments during ultrafiltration in polluted raw water

Yongwang Liu, Xing Li*, Yanling Yang, Siyang Ji, Jiawei Ren, Zhiwei Zhou

Key Laboratory of Beijing for Water Quality Science and Water Environment Recovery Engineering, Beijing University of Technology, Beijing 100124, China, Tel. +86 10 67391726; email: lixing@vip.com (X. Li)

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ABSTRACT

Different pretreatments, including coagulation, adsorption, and biofiltration, were used to identify the useful pretreatment for the ultrafiltration of polluted raw water. The following prefiltration investigation was conducted to identify foulants that were responsible for membrane fouling. Organic removal and particle size distribution of different pretreated samples were measured. The results indicated that the concentration of organic matter was not the critical factor that determined the extent of flux decline. The turbidity relevant materials, such as colloids and particles, were supposed to be important fouling-caused substances, and the particle size distribution also had a significant influence on flux decline. Moreover, the fouling resistance of different prefiltered samples showed that foulants sized over the membrane pore size caused the main part of the membrane fouling in raw water. Component analysis demonstrated that protein-like substances played a crucial role in membrane fouling; however, humic-like substances led to a weak membrane fouling.

Keywords: Ultrafiltration; Membrane fouling; Particles; Organics

*Corresponding author.

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