Color composition in a water reservoir and DBPs formation following coagulation and chlorination during its conventional water treatment in northeast of China

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\textbf{ABSTRACT}

In this research, the source of reservoir type water supply in northeast of China was determined through Minitan\textsuperscript{TM} ultrafiltration system and three-dimensional excitation emission matrix, providing the relationship between color, molecular weight cut off (MWCO) of natural organic matter (NOM), and disinfection byproducts (DBPs). Removal efficiencies of color, turbidity, and DBPs by conventional water treatment processes were also investigated. The results showed that MWCO of NOMs were mainly between <1 kDa and 5–10 kDa. There were two typical EEM peaks in reservoir water, in which peak A (Ex/Em: 260/450 nm) representing fulvic acid (FA)-like substances (1–5 kDa) and peak C (Ex/Em: 330/450 nm) standing for humic acids (HA)-like substances (MWCO > 5 kDa). HA contributed more to color than FA at high dissolved organic carbon. Macromolecular HA contributed more to haloacetic acids (HAAs) and small molecular FA made more contribution to trihalomethanes (THMs) and HAAs. During conventional water treatment processes, about 30% organic matters (OMs) (MWCO > 5 kDa) could be removed by coagulation–sedimentation process and total removal efficiency was more than 60% (HA mainly) after filtration process. However, only 22% OMs (MWCO < 3 kDa) could be removed limitedly, indicating the left OMs was small molecular.

Keywords: NOM; DBPs; Color; 3D-EEM; MWCO

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