



## Molecular weight distribution for NOM in different drinking water treatment processes

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### ABSTRACT

The purpose of this paper was to analyze molecular weight (MW) distribution in different drinking water treatment processes, and to find out the relationship between dissolved organic carbon (DOC) and disinfection by-products formation potential (DBPFP) in treated water. The results showed that in conventional water treatment, compared with similar methods, namely chlorination ( $\text{Cl}_2$ ) and potassium permanganate ( $\text{KMnO}_4$ ), pre-ozonation can reduce DOC concentration for larger MW fractions (>30k, 10k–30k and 3k–10 kDalton (Da)), while the smaller MW fraction portion increased. Coagulation, sedimentation and sand-filtration were effective to remove DOC in the larger MW fractions. Quantitative data were statistically explained. In combination with post-ozonation, biological activated carbon (BAC) can eliminate a large amount of DOC in the <1 kDa MW fraction. BAC with a 3-month service life had the optimal absorption and biodegradation effects. The treatment process was better at removing trihalomethane formation potential (THMFP) than haloacetic acid formation potential (HAAFP), though HAAFP concentration was reduced as well. In finished water, larger MW fraction had higher haloacetic acid (HAA) reactivity, and the part with lower than 1k and 1k–3k Da led to THMs formation.

*Keywords:* Ozone; DOC; Molecular weight; Organic matter; Drinking water

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