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Original Article

Study of Natural Organic Matter Characteristics and Fractions in Surface Water Resources of Tehran

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Abstract:

Background and Objectives: Natural organic matters (NOMs) are abundant in natural water resources and in many ways may affect the unit processes in water treatment. Although NOMs are considered harmless but they have been recognized as disinfection by-products (DBPs) precursors during the chlorination process. Formation of DBPs highly depends on the composition and concentration of NOMs. The objective of this study was to determine natural organic matter and its fractions concentrations in the surface water sources of Tehran.

Materials and Methods: Water sampling was conducted monthly between May to July in three rivers of Lar, Jajrood and Karaj, as the main drinking water supplying sources in Tehran. Quantitative parameters of pH, EC, UV₂₅₄ and DOC were studied based on standard methods. The XAD-7 resin method was used for fractionation of NOMs.

Results: Results showed that NOM concentrations in Lar, Jajrood and Karaj rivers were 8.53, 12.9 and 11.3 mg/L, respectively. The HPO (hydrophobic) fraction was predominant compared to the HPI (hydrophilic) fraction in water samples. The mean of total percent of HPO and HPI fractions were about 57% and 43%, respectively.

Conclusion: Since the hydrophobic NOM fraction exhibits higher trihalomethane formation potential (THMFP) than hydrophilic part, Tehran water chlorination exhibits higher THMFP than haloacetic acid formation potential (HAAFP). The information obtained from this study may be further employed in the design of the control techniques and management strategies for the water treatment plant, especially for DBPs reduction.

Keywords:

Natural Organic Matter (NOMs) . fractionation . hydrophobic . hydrophilic . water sources

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