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**Determination the Precursors of Disinfection Byproducts in Lake Water by  
Fluorescence EEM- PARAFAC Technique**

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Abstract:

Disinfection byproducts (DBP) such as trihalomethanes (THM) resulting from water disinfection are identified a threat to human health. Knowledge of dissolved organic matter (DOM) profile, a DBP precursor, is critical to DBP control in water treatment process. In an effort to identify the most reactive DOM component for DBP forming potential, fluorescence excitation-emission matrix (EEM) spectroscopy was applied to fractionating the DOM profile in 55 lake waters in Missouri. The EEM's generated from the waters were analyzed using a parallel factor analysis (PARAFAC), and the DBP forming potential was measured. Results indicated that DOM can be classified into 5 major factors with various origins. Among which the calculated component scores of factors 1 and 2, originated from terrestrial humic materials, were positively correlated with the forming potential of TTHM (total of four regulated trihalomethanes), suggesting that humic-containing DOM would be primarily responsible for DBP formation. The methodologies developed in this study would be potentially applicable to monitoring the DBP precursor level in treatment facility in context of water quality control and best treatment management.

Impact Statement:

Water quality of 55 lakes in Missouri was assessed for the forming potential of disinfection by products. Results were presented at the 2008 National ACS Conference. One manuscript has been submitted to Environmental Monitoring and Assessment for publication.

Category: Watershed Assessment and Restoration  
Type of Presentation: Oral Presentation