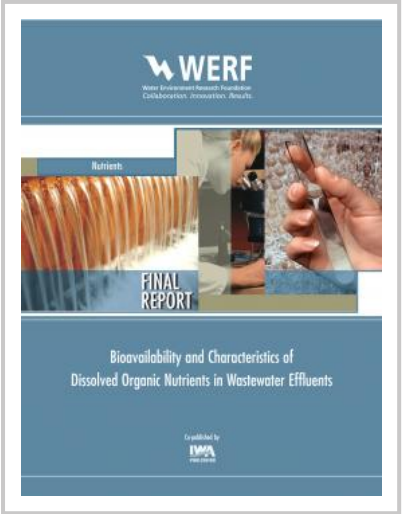
Bioavailability and Characteristics of Dissolved Organic Nutrients in Wastewater Effluents



This study aims to investigate and assess:

1) the bioavailability of various P fractions, particularly dissolved P fractions (DOP), in advanced wastewater effluents

2) the nature and composition of effluent DOP and its association with effluent dissolved organic nitrogen (DON);

3) the link and correlation of wastewater characteristics and treatment process with bioavailable effluent DOP.

Tertiary effluents from the selected representative wastewater treatment plants were collected and subjected to a detailed and comprehensive analysis for wastewater characterization, phosphorus fractions analysis, and bioavailability assays. Standard methods were employed for the phosphorus fractionation and speciation analysis. Waster effluent fingerprinting was performed using fluorescence spectrum and Parafac analysis to reveal the nature and characteristics of the effluent organic nitrogen and phosphorus. The bioavailability of P fractions in effluents were assessed using both chemical enzymatic assays and algal bioassay. For selected effluents, simultaneous DOP and DON bioavailability assay were performed to elucidate the differential availability of waste effluent-derived organic nitrogen and phosphorus and their association with hydrophilic versus hydrophobic fractions.

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