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## CHARACTERIZATION OF DISSOLVED ORGANIC MATTER IN HYBRID CONSTRUCTED WETLANDS USING THREE-DIMENSIONAL EXCITATION-EMISSION MATRIX FLUORESCENCE SPECTROSCOPY

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*This study focused on characteristics of dissolved organic matter (DOM) in a vertical flow constructed wetland (VF CW) with a free water surface constructed wetland (FWS CW) in front using three-dimensional excitation-emission matrix (3D-EEM) fluorescence spectroscopy. 3D-EEM fluorescence spectroscopy was employed to characterize the DOM samples along with the CW systems. Five main peaks could be identified from the 3D-EEM fluorescence spectra of the DOM samples in both CW systems. The fluorescence regional was divided into five parts and including five peaks using fluorescence regional integration method. The results indicated soluble microbial by-products (SMB) predominated in all the process and the DOM was mainly composed of SMB because of higher microbial activity and more microbial diversity in VF CW compared with FWS CW. We could conclude that VF CW had hardly removal ability of the humic acid-like. The hybrid CW systems had ability to remove the nonbiodegradable compounds and mostly owed to FWS CW.*

**Keywords:** dissolved organic matter, vertical flow constructed wetland, hybrid CW systems, three-dimensional excitation-emission matrix fluorescence spectroscopy, fluorescence regional integration.

### Introduction

Along with the development of spectroscopic techniques, fluorescence spectroscopy has been widely used to investigate the chemical properties and source of dissolved organic matter (DOM) in natural waters, and especially three-dimensional excitation emission matrix (3D-EEM) fluorescence spectroscopy has been successfully used to probe the chemical structure of DOM because

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