

Spectrophotometric Determination of Photohydroxylated Products of Humic Acid in the Presence of Salicylate Probe

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Abstract : Humic substances produce reactive oxygen species such as hydroxyl, phenoxy and superoxide radicals by oxidizing in a wide pH and reduction potential range. Hydroxyl radicals, produced by reducing agents such as antioxidants and/or peroxides, attack on salicylate probe, and form 2,3-dihydroxybenzoate, 2,4-dihydroxybenzoate and 2,5-dihydroxybenzoate species. These species are quantitatively determined by using HPLC Method. Humic substances undergo photodegradation by UV radiation. As a result of their antioxidant properties, they produce hydroxyl radicals. In the presence of salicylate probe, these hydroxyl radicals react with salicylate molecules to form hydroxylated products (dihydroxybenzoate isomers). In this study, humic acid was photodegraded in a photoreactor at 254 nm (400W), formed hydroxyl radicals were caught by salicylate probe. The total concentration of hydroxylated salicylate species was measured by using spectrophotometric CUPRAC Method. And also, using results of time dependent experiments, kinetic of photohydroxylation was determined at different pHs. This method has been applied for the first time to measure the concentration of hydroxylated products. It allows to achieve the results easier than HPLC Method.

Keywords : CUPRAC method, humic acid, photohydroxylation, salicylate probe

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