



Continuous determination of hydrogen peroxide formed in advanced oxidation and electrochemical processes

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ABSTRACT

A hydrogen peroxide (H₂O₂) auto-analyzer was developed to continuously detect H₂O₂ present in water, using a flow injection analysis (FIA) technique, during several advanced oxidation processes (AOPs) involving H₂O₂, such as ozone/H₂O₂, UV/H₂O₂, and ozone/UV, and an electrochemical process. The analytical method was based on a fluorometric method, using the reaction of *p*-hydroxyphenyl acetic acid and H₂O₂ in the presence of peroxidase enzyme. H₂O₂ was analyzed within the high (100–2,000 µg/L) and low (0–500 µg/L) concentration ranges, using both long and short reaction coils, respectively. The standard deviation and detection limit were 0.5 and 1.6 µg/L, respectively, and the coefficient of variation at 1 µg/L was 7.8%. This study also investigated the effects of Na₂S₂O₃ and NH₄Cl, which were used to quench the ozone and hypochlorous acid (HOCl) present in the samples, on the measurement of H₂O₂ during the ozone-based AOPs and electrochemical process.

Keywords: Hydrogen peroxide auto-analyzer; Flow injection analysis; Advanced oxidation process

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