

عنوان مقاله:

Quantification of Radicals Generated in a Sonicator

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خلاصه مقاله:

The hydroxyl radical ($\text{OH}\cdot$) is a powerful oxidant produced as a consequence of cavitation in water. It can react nonspecifically in breaking down persistent organic pollutants in water into their mineral form. It can also recombine to form hydrogen peroxide which is very useful in water treatment. In this study, terephthalic acid (TA) and potassium iodide dosimetry were used to quantify and investigate the behaviour of the generated OH radical in a laboratory scale sonicator. The 2-hydroxyl terephthalic acid (HTA) formed during terephthalic acid dosimetry was determined by optical fibre spectrometer. The production rate of HTA served as a means of evaluating and characterizing the $\text{OH}\cdot$ generated over given time in a sonicator. The influence of sonicator power intensity, solution pH and irradiation time upon $\text{OH}\cdot$ generation were investigated. Approximately $2.2 \times 10^{-9} \text{ M s}^{-1}$ of OH radical was generated during the sonication process. The rate of generation of the OH radicals was established to be independent of the concentration of the initial reactant. Thus, the rate of generation of $\text{OH}\cdot$ can be predicted by zero order kinetics in a sonicator.

کلمات کلیدی:

hydroxyl Radical, Hydrogen peroxide, Cavitation, Terephthalic acid, Sonicator, Dosimetry

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