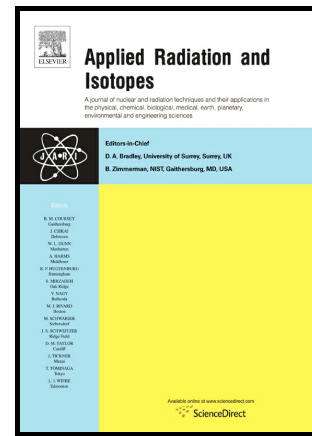


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Jhimli Paul Guin, Y.K. Bhardwaj, Lalit Varshney



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## Efficient Degradation of Butylparaben by Gamma Radiolysis

Jhimli Paul Guin\*, Y. K. Bhardwaj and Lalit Varshney

Radiation Technology Development Division,

Bhabha Atomic Research Centre, Trombay, Mumbai-400 085, India

*\*Corresponding author*

[E-mail: paul.jhimli@gmail.com; Tel.: +91 22 2559 0175; Fax: +91 22 2550 5151]

### Abstract

Gamma radiolysis and ozonolysis are two competitive advanced oxidation processes for degradation of organic pollutants present in the ground water. In this paper, the gamma radiolytic degradation of an emerging organic pollutant Butylparaben (BP) in aqueous solution has been investigated for the first time at different absorbed doses. The effect of the absorbed dose rate in the degradation and mineralization of BP has been investigated. About 65 % mineralization of BP was observed at absorbed dose of 70 kGy and dose rate of 0.7 kGy h<sup>-1</sup>. Interestingly, turbidity appeared in the solution during radiolysis at doses higher than 2 kGy, which disappeared again at very higher dose (~90 kGy) making the solution again transparent. At lower dose rate of 0.175 kGy h<sup>-1</sup> the turbidity was appeared at much lower dose about 1 kGy. However, the dose rate showed no effect in the dose of the disappearance of the turbidity. The hydrophobic fragments insoluble in water were generated during the initial stage of gamma radiolysis and those were completely mineralized to CO<sub>2</sub> and H<sub>2</sub>O by direct absorption of gamma radiation. About 90 kGy dose was required to achieve ~90% mineralization of BP. On the contrary, maximum 50%

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