



## Investigating the use of ozonation process with calcium peroxide for the removal of metronidazole antibiotic from aqueous solutions

Zhila Honrmandrad<sup>a</sup>, Ali Asadipour<sup>b</sup>, Mohammad Malakootian<sup>a,c,\*</sup>

<sup>a</sup>*Environmental Health Engineering Research Center, Kerman University of Medical Sciences, Kerman, Iran, Tel. +983431325128; email: m.malakootian@yahoo.com (M. Malakootian), zhilahonrmandrad@yahoo.com (Z. Honrmandrad)*

<sup>b</sup>*Department of Medicinal Chemistry, Pharmaceutics Research Center, School of Pharmacy, University of Medical Sciences, Kerman, Iran, Tel. +983431325001; email: aliasadipour@yahoo.com*

<sup>c</sup>*Environmental Health Engineering Department, School of Public Health, Kerman University of Medical Sciences, Kerman, Iran*

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### ABSTRACT

Advanced oxidation processes are one of the most efficient and effective methods for decomposing dangerous organic contaminants which are resistant and non-biodegradable in the aquatic solution. The aim of this study is to determine the efficiency of ozonation process with calcium peroxide for the removal of the metronidazole from aqueous solutions. This research is an experimental. A synthetic sample was prepared with a concentration of 5–40 mg L<sup>-1</sup> of the metronidazole. The removal efficiency of metronidazole and chemical oxygen demand (COD) by ozonation and calcium peroxide in different conditions such as pH, calcium peroxide concentrations, contact time, concentration of the metronidazole and 1 g of ozone per minute was examined. The optimal conditions for synthetic samples were obtained. Metronidazole and COD removal under optimal conditions with real samples were also tested. The maximum removal of metronidazole and COD with a concentration of 5 mg L<sup>-1</sup> metronidazole, pH = 3, 0.025 mg L<sup>-1</sup> of calcium peroxide, contact time of 40 min, were obtained in synthetic samples as 90.1% and 86.6%; and in real samples as 79.5% and 71%, respectively. Due to the relatively high removal efficiency of ozonation with calcium peroxide for the removal of metronidazole as a resistant combination to decomposition, this method is an effective method for the removal of contaminants.

*Keywords:* Metronidazole; Calcium peroxide; Catalytic ozonation; Advanced oxidation; Aqueous solutions

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\* Corresponding author.