

**Analysis and characterization of enhanced kinetic reaction on ozone generation using negative corona discharge**

**ABSTRACT**

Background and objective: Ozone gas has been used in microorganism treatment and is known as one of the strongest oxidizing agents. The main limitation of ozone is decay rapidly due to its short half-life. In this study, a novel method was established to enhance the production of ozonated water with lower decomposition time. Materials and method: The newly developed prototype was designed with improved technology to increase the kinetic reaction between ozone and water utilizing the parameters of high pressure and continuous flow. Ozonated water produced was examined using dissolved ozone meter with maximum detection of 20 mg L<sup>-1</sup>. The reaction and decomposition modeling of this system was developed and the dynamic structure of produced ozonated water was investigated using Raman spectroscopy. Results: The findings showed that the newly developed prototype facilitates a higher concentration of ozonated water with an ozone transfer rate of 2.5 L min<sup>-1</sup> and a lower decomposition rate with an average half-life 200 min. The results obtained from Raman spectroscopy showed the increases in ozonated water concentration leading to a decrease in the intensity of Raman peak, more likely approaching the Raman intensity of distilled water. Conclusion: This system was proven to be efficient in producing ozonated water at high volume and concentration with longer half-life which suits the domestic and industrial application requirements.