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Practical study for preparing ozonated water using diffuser and effects of temperature and treatment time

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Abstract

In this study the variation of dissolved ozone in deionized water was investigated using the real-time measurement technique. The ozone gas was generated by a homemade coaxial dielectric barrier discharge and injected into the bottom of the water column via a bubbler. The values of ozone concentration were measured by the UV absorption spectra obtained by two quartz windows mounted inside the water column. The results showed a fast increasing of dissolved ozone at the first 3 min and then, the concentration reaches to an approximately constant value which depends on the water temperature and gas phase ozone concentration. The highest concentration of dissolved ozone was obtained about 3.5 ppm at the lowest temperature (2°C) when the input gas contains 2500 ppm of ozone. The measurements were also continued after turning off the bubbler and decreasing of dissolved ozone were monitored. An approximate exponential decay of ozone was observed whose gradient did not show any meaningful dependency on temperature and treatment time of water.

Keywords: ozone solubility, coaxial dielectric barrier discharge, deionized water, mass transfer diffuser

For full article, refer to the Persian section