

عنوان مقاله:

Effect of Ozonation and Hydrogen Peroxide on Reducing the Volume and Chemical Oxygen Demand of WasteWater Treatment Plants Sludge

محل انتشار:

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تعداد صفحات اصل مقاله: 5

نویسندگان:

Mojtaba Ehsanifar - *Student Research Committee, School of Health, Iran University of Medical Sciences, Tehran, Iran*

Ahmad Jonidi Jafari - *Department of Environmental Health Engineering, School of Public Health, Iran University of Medical Sciences, Tehran, Iran*

Mehdi Shirzad Siboni - *Student Research Committee, School of Health, Iran University of Medical Sciences, Tehran, Iran- Department of Environmental Health Engineering, School of Health, Guilan University of Medical Sciences, Rasht, Iran*

Zahra Asadgo - *Student Research Committee, School of Health, Iran University of Medical Sciences, Tehran, Iran*

خلاصه مقاله:

Background: Ozonation decays solids and accelerates their consolidation due to strong oxidation capability; hence, decreasing the problems and expenses of equipment and operating the sludge digestion and disposal. In this study, we aimed to investigate the effect of separate and combined effects of ozone and hydrogen peroxide in reducing contamination volume. Methods: Sludge ozonation was conducted with concentrations of 0.0557 to 0.5573 mg O₃/mg TSS from 5 to 50 min. Total suspended solids (TSS), volatile solids (VS), chemical oxygen demand (COD) parameters, soluble COD, and the sludge settleability were investigated before and after the process. Results: The results demonstrated that after 50 min of ozonation and injection of mg O₃/mg TSS 0.3901 ozone, sludge volume reduction reached 42%. Furthermore, after 50 minutes of ozonation, TSS and VS with a 43% and 48% reduction, reached to 4261 mg/l and 3193 mg/l, respectively. Total COD after 35 min of ozonation decreased 39% from 12524 mg/l to 7639 mg/l. Also injection of 6 ml of hydrogen peroxide (30%) leading to a reduction in TSS and VS by 64 and 65%, respectively, and injection of 4 ml of it, resulting in a 58% reduction in COD and 75% in the volume of sedimented sludge. The effect of the combination of ozone and hydrogen peroxide resulted in the reduction of only 10% of sedimented sludge volume and also reduced removal of COD by 42%. Conclusion: According to the results, ozone and hydrogen peroxide injection to sludge, decreases sludge volume, improve in sedimentation and reduce the pollution load at the level of standards.

کلمات کلیدی:

Hydrogen Peroxide, Sewage, Waste Water

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