

Siwaporn Archariya 2014: Treatment of Fire Extinguisher Wastewater by Ozonation. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Associate Professor Patcharaporn Suwanvitaya, M.Appl.Sc. 105 pages.

Wastewater generated from the Emergency Response Training Center contains burnt Kerosene Oil with foam. The wastewater was found to contain varying amounts of BOD<sub>5</sub> (2,010 – 3,090 mg/L), and COD (4,743 – 11,410 mg/L). In all cases, these were higher than Industrial Effluent Standards for Factory Group II and III set by Thailand Pollution Control Department, and should be managed before disposal. Ozonation was found to be an appropriate and effective method for treating wastewater containing hydrocarbons.

This study examined the treatment of fire extinguisher wastewater using ozone. Wastewater was collected from the training site and treated with the ozone in one litre semi-batch reactors. BOD<sub>5</sub>, COD and FOG were analysed. The results from the ozonation experiment of Fire Extinguisher Wastewater (FEW) showed that ozone reacted on organic contaminants. Wastewater (at pH 7) was found to be the most favourable condition for BOD, COD and FOG removal. The experiment at pH 7 with 18 hours of contact time (16,757 mgO<sub>3</sub>/L) showed that 90% BOD could be removed. No ozone was detected in the off-gas outside the system. The highest COD and FOG reductions (86% and 67% respectively) were also achieved at this condition. However, the optimum condition of ozone treatment was found within the early stage (2 hours of treatment or 1,862 mgO<sub>3</sub>/L). The biodegradability, as indicated by BOD<sub>5</sub>/COD, was improved mostly at pH 7 from 0.2 to 0.6. The wastewater ozone-consumption rate was determined by the amount of ozone used in COD reduction. The ozone consumption rate at pH 7 of fire extinguisher wastewater was the highest, with a ratio change from 0.25 to 1.72 mgO<sub>3</sub>/mgCOD.

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