

Remediation of Total Petroleum Hydrocarbons in Soils by Combining Cyclodextrin and Microbubble Ozonation

*Kuan-Yi Kuo¹, Meng-hau Sung¹, Fu-yin Xie¹

1. Department of Environmental Science and Engineering, Tunghai University, Taiwan

In recent years, there have been many studies to increase the solubility of ozone by ozone-binding microbubbles or cyclodextrins, so that ozone has a better treatment effect. At present, no research has been conducted on the treatment of ozone in combination with microbubbles and cyclodextrins. Therefore, this study hopes to use ozone combined with microbubbles and cyclodextrin to treat the total petroleum hydrocarbons (TPH) in soil, and hopes to have better treatment effect than using microbubbles or cyclodextrin alone. This method is also a green remediation method that does not cause secondary pollution to the environment. In this study, ozone was first produced by an ozone generator and passed into a microbubble generator. Micron bubble ozone was then introduced into a water sample containing cyclodextrin, and finally the water sample was passed through a soil contaminated with TPH. In this study, different forms and concentrations of cyclodextrin were tested to examine their pertinent effects, so that the overall treatment efficiency of this method can be optimized. The instruments used in this study include spectrophotometer for the detection of ozone, LC with RID for the detection of cyclodextrin, and GC for the detection of TPH. It is expected that using microbubbles together with cyclodextrins simultaneously will improve the green remediation process.

Keywords: green remediation, soil treatment, total petroleum hydrocarbon, cyclodextrin, ozone microbubbles