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Monitoring Changes Occurring On the Substrates in Constructed Wetlands Fed With Landfill Leachate

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Extended Abstract

Constructed wetlands have been used for many years around the world to treat various types of industrial, municipal and agricultural wastewater [1]. Although substrates are important in contaminant removal, providing an environment for biofilm development, plant growth, and acting as an adsorbent in contaminant immobilization, to date, little research has been conducted on constructed wetlands fill materials used in landfill leachate treatment. Therefore, the aim of the study was to identify contaminants that remained after treatment in selected substrates constituting the filling of constructed wetlands with vertical flow fed by landfill leachate. Fourier transform infrared spectroscopy (FTIR) was used to identify contaminants. The FTIR method was chosen because previous research has shown that IR (infrared) spectra are not error-prone when samples are properly prepared [2]. In most cases, the difference in the position and intensity of the IR bands can be observed in the landfill leachate dosed systems and in the control variants. FTIR spectra confirmed changes in functional groups and substrate properties, illustrated by the shift of some bands of functional groups, including: peaks were recorded at wave numbers in the range of 1049-1012 cm^{-1}, which could result from the presence of inorganic substances, while peaks in the range of 1250-900 cm^{-1} most likely indicated the presence of polysaccharides and phosphodiesters. The obtained results could be helpful in developing a strategy for dealing with contaminants remaining after landfill leachate treatment in constructed wetlands [3].

References

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