



Development of Soil Distribution and Liquefaction Potential Maps for Downtown Area in Yangon, Myanmar

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Abstract

The presented paper describes an experimental study to reduce electrical conductivity (EC) of composting leachate-polluted water by using electrodialysis (ED) process. High efficiency, simple operation, low waste generation and selectivity are considered as major advantageous of applying ED process. Along with evaluation of ED method for desalination, the possibility of the process for COD (chemical oxygen demand) removal was also studied. The impact of applied voltage, feed concentration and process time on ED performances were investigated. Increasing of the applied voltage and decrease of feed concentration enhanced the reduction of EC and improved the COD removal from the sample. At optimal condition (Voltage=10 Volt, feed solution=Cf/4 and time operation=120 min), the reduction of EC and COD removal were 92.7%, and 83.8%, respectively. Applying higher voltage and using more feed solution concentrations resulted in more energy consumption. The obtained results showed that ED method can be considered as an acceptable method to reduce salt and organic content.

Keywords: Electrodialysis; Electrical Conductivity; COD; Membrane; Composting Leachate-Polluted Water.

1. Introduction

Along with considerable benefits of composting process, which is a technology for converting organic matter to organic fertilizer, there is always rise of high different types of biodegradable and non-biodegradable contaminants within the process [1]. Consequently, release of leachate without proper treatment pose serious threats to the environment and human health [1, 2].

Although there are several biological and physic-chemical methods to treat leachate, due to the complex composition of leachate, conventional treatment processes are not promising enough for the treatment of this kind of wastewater [3-5]. In recent years, advanced oxidation processes have been widely used as an alternative method for treatment of refractory wastewater [5-7]. In our previous experience, the performance of Electro-Fenton (EF)-which is an advanced oxidation method-for reduction of chemical oxygen demand (COD) from composting leachate-polluted water was investigated. Results illustrated a COD removal efficiency (up to 50%) in optimal condition which obtained at initial pH of 3, current of 3A, H₂O₂ concentration of 10 mL and process time of 60 min.

However, during EF method, the electrical conductivity of the water increased from 5 to 15 mS/cm. Since there is a

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