Environmental Engineering and Management Journal xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu

"Gheorghe Asachi" Technical University of Iasi, Romania

PHYSICO-CHEMICAL CHARACTERIZATION OF MEKNES MUNICIPAL LANDFILL LEACHATE: THE ASSESSMENT OF THE SEASONAL EFFECTS USING PCA

Soukayna Rhouat*, Mohamed salaheddine El youbi, Fouad Dimane

[1]Laboratory of Electrochemistry, Materials, Environment and Modelisation, Faculty of Sciences, University campus, P.B 133, Kenitra 14000
[2] National School of Applied Sciences, Center Ait Youssef Ou Ali, Ajdir, El hoceima 32003

Abstract

The increase of population and the bad management of municipal solid waste (MSW) lead to a spectacular increase of the landfill leachates volume. These effluents represent a very harmful threat that can affect the environment and the ecosystems, their control and treatment became the first occupation of the authorities. In this context, this study contributes to characterize the landfill leachate composition and how its changes over different seasons.
The results have shown an intermediate leachate with high concentration of organics and minerals components, with an average of 16 455.71 mg O_2/l for COD, 6681.86 mg O_2/l for BOD5, 2469.57 mg/l for Suspended matter (SM), 2990 mg/l for Ammonium and 31259.71µS/cm for Electrical Conductivity (EC).
The leachate parameters seasonal variations were revealed by the principal analysis component (PCA); an explorative tool. Conferring to PCA results, we can define the correlation between the parameters concentrations and the climatic conditions (Temperature and precipitations). The parameters such as electrical conductivity, suspended solids, BOD_5, COD, ammonium, correlate positively with temperature values, that means, the warmer is the season, the higher are the values. While for pH, dissolved oxygen and nitrates values, there is a negative correlation, which means that their loads increase during cold and rainy periods.
This work helps to understand the composition of landfill leachates, to induce the seasonal effect on it and to guide the treatment chain to attend the most stringent discharge standards.

Key words: characterization, correlation, leachate, season, variations

Received: January, 2019; Revised final: March, 2019; Accepted: April, 2019

*Author to whom all correspondence should be addressed: e-mail: soukayna.rhouat@gmail.com; Phone: +212 677 638 890