



## Post-treatment of anaerobically-treated compost leachate by membrane systems: emphasis on molecular weight distribution

Sinan Acun<sup>a</sup>, Suna Ozden Celik<sup>b,\*</sup>, Mehmet Cakmakci<sup>c</sup>, Dogan Karadag<sup>c</sup>, Bulent Armagan<sup>d</sup>, Bestamin Ozkaya<sup>c</sup>

<sup>a</sup>Kocaeli Metropolitan Municipality, General Directorate of Izmit Hydraulic Works, Projects Departments, Kocaeli, Turkey, Tel. +90 262 317 31 19, email: acunweb@hotmail.com

<sup>b</sup>Namik Kemal University, Environmental Engineering Department, TR-59860 Tekirdag, Turkey, Tel. +90 282 2502362, Fax +90 282 2509924, email: sunacelik@nku.edu.tr, sozdencelik@gmail.com

<sup>c</sup>Department of Environmental Engineering, Yildiz Technical University, TR-34220 Istanbul, Turkey, Tel. +90 212 383 5381, email: cakmakci@yildiz.edu.tr (M. Cakmakci), Tel. +90 (212) 383 5384, email: dkaradag@yildiz.edu.tr (D. Karadag), Tel. +90 212 383 5100, email: bozkaya@yildiz.edu.tr (B. Ozkaya)

<sup>d</sup>Istanbul University, Environmental Engineering Department, TR-34320, Istanbul, Turkey, Tel. +90 212 4737070/17725, Fax +90 212 4737180, email: bulent.armagan@istanbul.edu.tr

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### ABSTRACT

Compost leachate contains high concentrations of organic matter, sulphate and ammonia which requires combined treatment systems. In case of the use of membrane containing combined systems, the effect of pretreatment on molecular weight distribution (MWD) is important in terms of appropriate membrane selection. In this study the leachate from Istanbul full-scale composting plant was firstly treated in an anaerobic fluidized bed reactor (AFBR). Performance of the reactor was low due to the inhibition by high ammonia content while treatment efficiencies of COD and  $\text{SO}_4^{2-}$  were around 41% with 50% ammonia removal. During the anaerobic treatment high molecular weight materials were mostly converted to low molecular fractions. However, changes in the distribution of molecular fractions differed in each pollutant parameters. Subsequent membrane treatment scheme was determined according to the molecular weight distribution analyses. Particular and colloidal materials from AFBR effluent was effectively treated by MF and UF membranes. Post-treatment studies were performed using four different NF and RO membranes and performance comparison was made based on removal efficiency and flux changes. BW30 membrane provided the lowest treatment efficiency while other TXN45, NF90 and XLE membranes had similar effluent quality. Effluent from all membrane systems met discharge limits and optimum treatment scheme has been suggested as AFBR+MF+UF+TXN45 based on operational flux values.

*Keywords:* Compost leachate; AFBR; Molecular weight distribution; NF; RO membrane

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\*Corresponding author.