Environmental Engineering and Management Journal November 2021, Vol. 20, No. 11, 1711-1719
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu

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DAIRY WASTEWATER UTILIZATION BY COMBINATION OF OXIDATION PRE-TREATMENT AND ULTRAFILTRATION

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Abstract

In this work the effects of oxidation pre-treatments (ozonation and Fenton reaction) on membrane filtration of dairy wastewater were investigated, together with the further utilization possibilities of residual wastes. The oxidation pre-treatments enhanced the membrane filtration efficiency, from which the short-term ozone treatment was found to be the most effective method both in terms of increasing the flux and the pollutant removal efficiency. After ozone pre-treatment the phosphate and ammonium content of the wastewater migrated to the permeate, while after Fenton pre-treatment the phosphate content remained in the concentrate, and the ammonium content in the permeate decreased. The concentrate was utilized as biogas resource and it was found that both pre-treatments increased the biogas production and its methane content as well. Based on our results it can be concluded that ozone pre-treatment combined with membrane separation have improved the efficiency of dairy wastewater treatment and may suit the requirements of circular economy.

Key words: biogas, dairy wastewater, membrane separation, ozone, pre-oxidation

Received: July, 2020; Revised final: January, 2021; Accepted: March, 2021; Published in final edited form: November, 2021

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