

Zero waste system comprised of fixed bed biofilm reactor, ozone oxidation, and
electrodialysis desalination for wastewater sustainability

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Abstract

Wastewater processing mediates industrial and domestic wastes and supports societal, ecological, and economic values. Unfortunately, no single process alone is able to sustain wastewater processing. Thus, a Zero Waste System was devised combining fixed bed biofilm reactor (FBBR), ozonation, and electrodialysis to treat palm oil mill effluent (POME). The POME pollutants were biodegraded into smaller molecules inside the FBBR. This bioreactor was fully packed with Micro Media, Ultra Media, Kaldnes K1 micro, and green ammonia absorption stones. During the biodegradation, biogas and biomass were generated as valuable products. Ozonation oxidized all the FBBR effluents at an ozone dose of 15 mg/L for 24 h before being discharged for electrodialysis because bioremediation definitely does not decompose all suspended solids. Then, the electrodialysis received the ozonated effluents and

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