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عنوان مقاله :

Treatment of highly polluted industrial wastewater by means of sequential aerobic biological oxidation-ozone based AOPs

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The feasibility of the treatment of a complex industrial wastewater by aerobic biodegradation in a sequential batch reactor (SBR) followed by ozone-based advanced oxidation processes (AOPs) has been studied. The industrial wastewater had high organic load ($\text{TOC} > 3 \text{ g L}^{-1}$, $\text{COD} > 12 \text{ g L}^{-1}$, $\text{BOD}_5 > 2 \text{ g L}^{-1}$) including some toxic/harmful compounds and high concentration of metal and other inorganic species. SBR treatment of the industrial wastewater diluted with urban wastewater (dilution 1:5), was successful after complete acclimation of the mixed culture (i.e., $>50\%$ COD and TOC removals). Nevertheless, the SBR effluent was still not acceptable to be disposed into the environment (c.a. $\text{COD } 850 \text{ mg L}^{-1}$) so ozonation, solar photo-ozonation and solar photocatalytic ozonation processes were investigated as further polishing treatments. Thus, the sequential combination of aerobic biodegradation and solar photocatalytic ozonation with a TiO_2 -based catalyst led to an effluent suitable for discharge into the aquatic environment according to environmental regulations ($\text{COD} < 125 \text{ mg L}^{-1}$, $\text{BOD}_5 < 25 \text{ mg L}^{-1}$).