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A COMPARATIVE STUDY OF ELECTROCOAGULATION AND CHEMICAL COAGULATION PROCESSES APPLIED FOR WASTEWATER TREATMENT

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Abstract

This study considers the quality improvement of wastewater generated by a municipal wastewater treatment plant for further reuse in fisheries, agriculture and recreation.

The water provided from the municipal wastewater treatment plant has quality indicators exceeding the maximum discharge limits such as: dissolved organic compounds (expressed as COD), total suspended solids (TSS), total nitrogen (NT), total phosphorus (PT), salinity and turbidity. The performances of the electrocoagulation and chemical coagulation are presented comparatively, as water treatment technologies taken into consideration to reach the above mentioned purposes in agreement with the European directive 91/271/EEC.

In this case study, the best performances were obtained for the electrocoagulation, the comparison being made with chemical coagulation. For the electrocoagulation were used iron and aluminium electrodes, while for chemical coagulation FeCl_3 and $\text{Al}_2(\text{SO}_4)_3 \cdot 3\text{H}_2\text{O}$ were used. According to the preliminary results obtained in this study, the iron electrodes are more promising (considering performances as: efficiency and water quality) in comparison with the aluminum electrodes, even if they require a filtration final treatment step for iron removal. In order to establish the optimal experimental conditions for the electrocoagulation process, other experimental parameters should be taken into consideration in future studies such as: current density and water flow rate through the electrochemical reactor.

Key words: coagulants, electrodes, wastewater treatment, water quality indicators

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