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OPTIMIZATION OF *CHLOROPHYLL A* REMOVAL FROM WASTEWATERS USING BIO-INSPIRED ALGORITHMS

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Abstract

The bio-inspired algorithms are versatile approaches that can be applied to a variety of problems. However, their efficiency is influenced by a multitude of characteristics such as quality of final solution, consumed computational resources, diversity management, convergence, complexity of the problem being solved. Consequently, the issue of choosing the best approach for a particular problem is a difficult task. In this work, the performance of two bio-inspired algorithms, Differential Evolution (an improved version) and Differential Search, is tested on an electro-coagulation process applied for removing *chlorophyll a* from the final effluent of aerated lagoons in a wastewater treatment plant. Based on a set of experimental data, a regression model was generated to determine the correlations between the process characteristics and the remained *chlorophyll a*. After that, a set of simulations using the two algorithms were performed with the goal of determining the optimal conditions leading to a minimization of *chlorophyll a* in two different cases: i) when the interval for the process parameters is the same with the experimental data and ii) when limits on the process parameters were imposed (as a mean to reduce the resources consumed). The results obtained indicated that the two algorithms are able to provide acceptable results.

Key words: electro-coagulation, chlorophyll a, differential evolution, differential search

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