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APPLICATION OF ARTIFICIAL NEURAL NETWORKS FOR STUDYING THE DYNAMICS OF THE PROCESS OF ISOLATION OF NATURAL COMPONENTS

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The main goal of this work is the design of a green process for isolation of natural products by supercritical CO2 and the implementation of artificial neural network modeling to study the dynamics of the investigated process. Solvents define a major part of the environmental performance of processes in the chemical industry and impact on cost, safety and health issues. The idea of green solvents expresses the goal to minimize the environmental impact resulting from the use of solvents in chemical production [1,2]. The investigated separation process supercritical CO2 extraction, conforms to the basic principles of the green chemistry as well as the green process engineering, considering that the supercritical CO2 represents a green solvent, whereas the extraction process generates a pure, solvent-free extract [3,4]. This green process was optimized in order to produce maximal profitability with minimal environmental impact. The utilized natural raw material represents a low-cost by-product of the fish industry. Fish viscera, fillets and caviar were used in the experimental work and generated results provided the necessary data matrix for the artificial neural network modeling of the designed process. In the frames of this work, an artificial neural network was created and developed for prediction of the extraction yield as a function of the operating parameters and their interactions, using MATLAB/Neural Network Toolbox [1-4].

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