MODELING OF OPTIMAL COAGULANT DOSE USING ARTIFICIAL NEURAL NETWORK, APPLICATION TO WATER TREATMENT PLANT OF GUELMA

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Abstract

Surface water from the Hammam Debagh dam is one of the main sources of drinking water for the population of the town of Guelma. The aim of this study is to apply artificial neural networks to predict the coagulant dose for the potabilisation process at the Hammam Debaghe plant, using the various quality parameters of the raw water received from the Bouhamdane dam reservoir. The application of this model for coagulant dose prediction is of particular interest given its simplicity and ease of use for estimating the daily coagulant dose of the treatment process. These results can be a very good indicator for operators and can be used to help manage and operate the various compartments of the treatment process. Overall, the results show that RNA models are promising alternatives for coagulant dose estimation. However, further improvements to RNA structures need to be investigated. However, further improvements to the RNA structures need to be investigated. The input data for the MCP model are pH, temperature, turbidity and conductivity in the raw water at the plant inlet. The model built to predict the coagulant dose of the treatment process in the Hammam Debaghe treatment plant consists of 4 neurons in the input layer, 9 neurons in the hidden layer, and 1 neuron in the output layer. The results of the model show that the regression coefficient R = 0.8066, indicates that the PMC model is able to respond well to the training data and is able to reconcile them. The PMC model is therefore able to solve the specific problem of input-output data mapping. Using this model will therefore enable operators to: Reduce the costs and time required to carry out experimental Jar-tests; as well as predict an appropriate dosage for the quantities of coagulant to ensure the production of drinking water in compliance with Algerian standards.

Key words : Learning, coagulant, optimal dose, neural networks, turbidity.