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NEURAL MODELING AND OPTIMIZATION OF A MECHANICAL-CHEMICAL TREATMENT APPLIED FOR SOME INDUSTRIAL EFFLUENTS. A ROUMANIAN CASE STUDY

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Abstract. The paper proposes an artificial neural network (ANN) model of multilayers perceptron type (MLP3:10:1) adapted for mechanical-chemical treatment system of an industrial effluent (*i.e.* coagulation-flocculation - sedimentation applied for an industrial effluent produced in a manufacturing plant of bricks and other ceramic products). This model of multiple inputs-one single output considers three input variables (independent variables) like the temperature (z_1), dose of polyelectrolyte (z_2) and agitation time (z_3) and one single output variable (dependent variable) as the removal of turbidity (Y_1) or colour (Y_2). Consequently, the proposed ANN model is optimized and also tested for some data from outside of the training experimental field. The optimal removal of turbidity (91.7%) is performed working at a temperature of 20°C, with a polyelectrolyte dose of 20 mg/L, for 30 min of agitation at 50 rpm, and in the case of optimal colour removal (92.2%) by working at a temperature of 26°C, with a polyelectrolyte dose of 15 mg/L, for no more than 30 min of agitation at 50 rpm, respectively.

Keywords: artificial neural network (ANN), industrial wastewater treatment, multilayers perceptron model (MLP).

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