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INVESTIGATION OF EXPERIMENT DATA AND SENSITIVITY COEFFICIENT DATA WITH ARTIFICIAL NEURAL NETWORK IN THE OHMIC HEATING PROCESS FOR SOUR ORANGE JUICE

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ABSTRACT

In this investigation, an ohmic heating system was constructed and applied to the heating process at three voltage gradient inputs (8.33, 10.83, 13.33 V/ cm) and three percent weight loss sample (10, 20 and 30%) compared to total weight was selected. During the thermal process, the power consumption, electrical conductivity and coefficient performance system were calculated. All experiments were performed in three replications. An artificial neural network was used to predict experimental data. In this study multi-layer perceptron were selected and radial basic function artificial neural network by 1 hidden layers and 4, 8 and 12 neurons hidden layers, and with two activation function (hyperbolic tangent and sigmoid). The highest R values were for power consumption (0.998), electrical conductivity (0.996) and Coefficient performance systems (0.999) in a MLP network with 8 neuron in hidden layer and sigmoid activation. Also the fastest network with lowest EPOCH was in a network of 12 neuron. According to the results obtained for R, MSE and learning cycle, it can be said that the neural network has ability to predict power consumption, electrical conductivity and coefficient performance systems to an acceptable level for ohmic processing.