

Abstract

In this study, An hybrid of artificial neural network-genetic algorithm (ANN-GA) was used for the development of a microwave-assisted extraction method for determination of target element (zinc, copper, iron and manganese) in tea samples using flame atomic absorption spectrometry (FAAS). A multiple response function (R_m) was applied to describe the experimental conditions for simultaneous extraction of the target element. The power, temperature, extraction time and volume of solvents were the input variables, while R_m was the output. Optimum conditions were 360 W, 103 °C, 27 min and 2.7:7.3 mL for power, temperature, extraction time and volume of nitric acid: hydrogen peroxide (as solvents), respectively. High determination coefficient between the actual and the predicted data by ANN model ($R^2=0.983$) indicated the goodness of fit. The developed procedure was then applied to the extraction and determination of these elements in some tea samples.

Keywords: Tea, Zinc, Copper, Iron Manganese, Microwave-assisted extraction, Artificial neural network, Genetic algorithm, Flame atomic absorption spectrometry



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