University of Zabol
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(In The Field Of Analytical Chemistry)

Application of hollow fiber for electromembrane extraction of gold from water samples

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Abstract:

In this work, an electromembrane extraction (EME) technique was used for the extraction and determination of gold from water samples prior to UV-Vis spectrophotometry. An artificial neural network (ANN) combined with imperialist competitive algorithm (ICA) has been applied to optimize the EME. The effective parameters including pH of acceptor phase, extraction time (t), volume of sample solution (V), stirring rate (S) and voltage (E) were chosen as input variables and the extraction recovery of gold was considered as output variable. The mean of squared error (i.e. 0.0009) and determination coefficient (i.e. 0.9821) were applied to estimate the performance of the ANN model. The limit of detection was 4.5 μg L^{-1}(S/N=3) on the optimized variables. The intra and inter day precisions (%) were found to be 6.7% and 2.6%, respectively. This technique was then applied for analysis of gold from environment water samples.