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OPTIMIZATION BY NN – GA TECHNIQUE OF THE METAL COMPLEXING PROCESS.
POTENTIAL APPLICATION IN WASTEWATER TREATMENT

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Abstract

Some samples consisting in silica functionalized in different degrees with dihydroxy-azomethine groups have been tested as sorbents for copper (II) ions from aqueous solutions in different conditions. An indirect monitoring procedure for the complexing process was approached: UV-VIS absorption intensity – time variation for the metal-containing solution in which complexing silica was soaked. In order to find the conditions in which the maximum efficiency in the metal absorption can be obtained (maximum decreasing of the UV absorbance), a method based on neural networks and genetic algorithms (NN-GA) was applied. The model included into the optimization procedure was a feedforward neural network with one hidden layer. The optimization problem was solved with a standard genetic algorithm, which computed the optimal values for reaction conditions ($CuCl_2$ solution concentration, pH, complexing groups density in silica) leading to minimum relative absorbance of the metal in shortest time.

Key words: complexed metals, functionalized silica, genetic algorithm optimization, neural network modeling

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