

. Abstract

In this study, a solid phase extraction using the new sorbent (zinc oxide/chitosan nanoparticles) has been developed for preconcentration and determination of trace amount of uranium from water samples. Hybrid modeling of cuckoo optimization algorithm–artificial neural network (COA–ANN) has been employed to develop the model for simulation and optimization of this method. The pH, volume of elution solvent, mass of zinc oxide/chitosan nanoparticles concentration of PAN, flow rate of sample and elution solvent were the input variables, while recovery of uranium was the output. At the optimum conditions, the limit of detections and enrichment factor were $0.5\mu\text{g.L}^{-1}$ and 125, respectively for the uranium. The developed procedure was then applied to the extraction and determination of uranium from water samples.

Keywords: Solid-phase extraction, Zinc oxide/Chitosan nanoparticles, Uranium, Artificial neural network, Cuckoo optimization.



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**The Thesis Submitted for the Degree of Master of Science
(In the field of Analytical Chemistry)**

**Solid phase extraction of uranium using
zinc/chitosan oxide nanoparticles from water
samples**

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September 2014