



University of Zabol
Graduate School
Faculty of Science
Department of Chemistry

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

Title:

**Development of a new method based on combination
of gel-electromembrane extraction with switchable
hydrophilicity solvent-based liquid-liquid
microextraction for the determination of atropine**

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Abstract

In this study, a new method based on a combination of electromembrane gel with liquid-liquid microextraction based on a switchable hydrophilicity solvent and its detection by gas chromatography-mass spectroscopy for preconcentration of atropine and its detection in real samples including human urine, tap water, and drinking water is developed. Experimental parameters have been optimized for both electromembrane extraction and SHS solvent-based liquid-liquid microextraction. Using agarose gel membrane, analytes were extracted from 10 mL of sample solution to 500 μ L of acceptor phase. The maximum value is determined in the optimal conditions of pH of the acceptor solution 10, pH of the sample solution 5, voltage value of 30 volts and extraction time of 25 minutes. Then the acceptor solution was transferred to the test tube and the experimental conditions of the second stage were optimized. Optimum conditions, linear range in the range of 5-500 micrograms/liter, detection limit 1.5 micrograms/liter and preconcentration factor 170.6 were obtained. Finally, the proposed method makes it possible to determine the target analyte in urine samples, tap water and drinking water with acceptable accuracy.

Keywords:

Gel-electromembrane extraction, liquid-liquid microextraction based on switchable hydrophilicity solvent, homogeneous liquid-liquid microextraction, atropine, gas chromatography-mass spectrometry