

Abstract

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Title: Optimization of neonicotinoids extraction using nanofibers in sequential injection analysis system

In this diploma thesis, we tested the use of various nanofibers as sorbents for solid phase extraction of neonicotinoids connected with sequential injection analysis system. Seven types of nanofibers were tested, specifically polyamide (PA6), polycaprolactone (PCL), polyimide (PID) and polydopamine coated polyamide (PA6)_{coated}, polycaprolactone (PCL)_{coated}, polyimide (PID)_{coated} and a combination of polyimide and polycaprolactone (PID/PCL)_{coated}. These nanofibers were produced by electrospinning.

The studied nanofibers were placed in the 3D printed holder, which was connected into sequential injection analysis system. UV spectrophotometry was used as a detection method.

The substances to analyse were neonicotinoid insecticides. The retention of these analytes was examined with all seven types of nanofibers. Retention of the analytes on the tested nanofibers depending on their chemical structures and physical-chemical properties was studied in these measurements. The most experiments were performed with polydopamine coated polyimide nanofibers, due to the highest retention of all tested analytes.

The aim of this diploma thesis was to develop a simple method for testing the suitability of nanofibers as sorbents for solid phase extraction of neonicotinoid pesticides.