Abstract

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Title of diploma thesis:	Testing of nanofibers as potential sorbents for solid phase extraction using sequential injection analysis

This diploma thesis deals with the testing of various types of nanofibers which can be used as sorbents in solid phase extraction in a sequential injection analysis system. The tested nanofibers were made by electrospinning. The polyamide (PA) and polyvinylidene fluoride (PVDF) nanofibers were used. Female sex hormones, non-steroidal anti-inflammatory drugs, H_2 antihistamines, bisphenols and clenbuterol were chosen as model analytes.

The analysis was carried out in the sequentional injection analysis (SIA) in which a polymethylmethacrylate column was integrated. The column was filled with one type of the tested nanofibers. The detection was performed by a spectrophotometer at a wavelength of absorption maximum of the selected analytes. The retention of individual analytes on the nanofibers was observed depending on the chemical structure and the physicochemical properties. The most measurements were carried out with polyvinylidene fluoride nanofibers where high retention of tested analytes was observed.

The most retained analytes were from the group of the female sex hormone, bisphenols and non-steroidal anti-inflammatory drugs. On the contrary, the lowest capture was recorded for clenbuterol. Next measurements were performed with diclofenac, where complete retention on PVDF nanofibers was recorded.

The goal was to develop a general analytical method with nanofibers for extraction of various types of substances on PA and PVDF nanofibers in a sequential injection analysis system. The tested nanofibers have been proved as a potential sorbent for solid phase extraction in the SIA system.