ABSTRACT

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Title of Doctoral Thesis **Modern chromatographic techniques in food contamination analysis**

A compilation of seven publications dealing with chromatographic methods for determination of food contamination (particularly mycotoxins and artificial food colorants) is presented in dissertation thesis. All methods were fully validated, complying with the requirements and applied for real samples analysis.
The first part describes the methods for mycotoxins determination based on on-line solid phase extraction (SPE) utilizing column-switching system. Reversed phase columns packed with superficially porous particles were chosen for both extraction and separation step during optimization of on-line SPE-HPLC method for ochratoxin A and citrinin determination in beer. In following work, determination of patulin in juices and zearalenone in beer, more selective molecularly imprinted polymers (MIP) were used for on-line extraction. Due to challenging optimization of on-line MIP SPE, the methods were compared to off-line MIP extraction and on-line extraction using conventional C18 phase to confirm the selectivity.
The employed commercial MIP sorbents were not as selective for on-line extraction as expected. For that reason, original MIP sorbents were prepared by polymerization for other projects. At first, the method for coumarins determination in herbal samples was optimized. Citrinin-selective MIP for the last on-line MIP SPE method was prepared. After the MIP characterization and extraction effectivity evaluation, it was employed for development of on-line MIP SPE-HPLC method for citrinin determination in dietary supplements and cereals.
The second part of dissertation thesis is represented by methods for synthetic food colorants determination in beverages and candies, comparing the separation on advanced stationary phases packed with superficially porous particles or monolith.