

13. SUMMARY

This thesis deals with the results of applications of electrophoretic methods in the separation and determination of pharmaceutical important compounds of synthetic or herbal origin. In the theoretic part, the classification of the capillary electrophoretic methods is presented. Capillary zone electrophoresis, capillary isotachopheresis and micellar electrokinetic chromatography were used in this work. These electro-migration methods represent extremely potent separation techniques.

The most of the theoretic part is devoted to the popular topic of chiral separations. Especially CZE presents a competition to the HPLC methods in the area of chiral separations. Implementation of a chiral selector into a background electrolyte enables more dynamic and faster optimizing conditions used for chiral separation. That means better discrimination and lower price of analysis.

In the result section the first three experimental works describe the application of CZE in pharmaceutical analysis to control the content and optical purity of pharmaceutical active compounds. Successful discriminations of racemic mixture of rivastigmine, tamsulosine and sibutramine, their determination in HVLP and optical purity control, show that the developed, optimized and validated CZE methods offer accurate and correct results. The main benefits of CZE methods are high separation efficiency, short time of analysis, use of the aqueous buffers and commercial available chiral selectors, easy and fast sample preparation and low consumption of buffers and samples. According to the mentioned advantages, the CZE methods are good alternative to the dominative HPLC techniques in the area of chiral separations.

MEKC allows separation of neutral, hydrophobic or water insoluble analytes. The technique was used for the simultaneous determination of clotrimazol, methylparabene and propylparabene in preparation Clotrimazol HBF with respect to the acid base properties of analytes.

Another part of this dissertation presents two issues dealing with the development of ITP techniques as control-analytical methods for the selective determination of pharmaceutically important compounds of chemical origin suitable for the quality control of bulk substances as well as mass-produced dosage form. The determination of β -blockers pindolol and acebutolol in Disertační práce Summary pharmaceuticals by ITP provided reliable results. The main advantages of ITP technique are relatively short time of analysis, the use of aqueous buffers and low running costs.

The last part of this work was focused on the application of a stacking-CZE method used for the separation and determination of phenolic acids in extract of *Epilobium parviflorum*. The samples were injected directly into the separation system without any pre-treatment. The model mixture contained cinnamic, gentisic, coumaric, ferulic, vanillic, syringic and caffeic acids. The electrophoretic separation was optimized by large volume sample stacking with polarity switching mode. This modified CZE method proved to be a powerful tool for sensitivity enhancement in CZE analysis of selected aromatic acids. A 40-fold sensitivity enhancement has attained for the quantitative analysis of extremely diluted analytes in low conductivity matrices. The proposed method is intended for the identification and assay of the selected phenolic acids in the methanolic extract of *Herba epilobi*.