This thesis deals with the use of electrophoretic methods in the analysis of pharmaceutically important compounds.

In the theoretical part, the classification of capillary electrophoretic techniques is discussed. Capillary zone electrophoresis (CZE, capillary isotachophoresis (ITP), micellar elektrokinetic chromatography (MEKC), microemulsion elektrokinetic chromatography (MEEKC), isoelectric focusation (IEF), capillary electrochromatography (CEC) and capillary gel electrophoresis (CGE) are described. Further, on-line pre-concentration methods are described. Particular attention is given to the on-line combination of capillary isotachophoresis with capillary zone electrophoresis using column coupling arrangement. This combination enables the improvement of the selectivity of separation and the improvement of the limit of detection of analytes present in complex matrices of biological and environmental origin.

Afterwards, the results of the experimental analyses are presented:

1. The first paper deals with the use of CZE in the analysis of ibuprofen and flurbiprofen in pharmaceuticals. Separation was carried out in a fused silica capillary (60 cm x 100 µm I.D effective length 45 cm) at 30 kV with UV detection at 232 nm. The optimized background electrolyte was 20mM *N*-(2-acetamido)-2-aminoethanesulfonic acid (ACES) with 20mM imidazole and 10mM α-cyclodextrin of pH 7.3. The validated method has been successfully applied for the routine analysis of ten commercially available pharmaceutical preparations in different dosage forms (syrup, tablets, cream and gel). Single analysis took less than 5 min.
2. The second paper deals with the use of MEKC for the separation and determination of clotrimazole, methylparaben and propylparaben. Separation was carried out in a fused silica capillary (60cm x 75µm I.D.) at 25 kV with UV detection at 212 nm. The optimized background electrolyte was 15 mM phosphate buffer (pH 7.2) containing 30 mM sodium dodecyl sulfate (SDS) as a surfactant. The total analysis time was less than 12min and the results are fully comparable with those obtained with the validated HPLC method.
3. The third part of the experimental work deals with the analysis of β-blocker pindolol by ITP with conductimetric detection. The optimal LE was was 10 mM potassium picolinate with 10 mM picolinic acid (pH 5.1), the TE was 10 mM formic acid. The optimized method was applied in the analysis of pindolol in Apo-Pindol tablets.

4. The on-line ITP-CZE was used for separation and quantification of fourteen selected natural constituents in red wine belonging to flavonoids and phenolic acids. BGE-S-BGE system was used for the separation. The leading electrolyte in the ITP pre-separation step was 10mM HCl of pH* 7.2 with TRIS as counterion, the terminating electrolyte was 50mM boric acid of pH* 8.2. The background electrolyte in the electrophoretic step contained 25mM MOPSO, 50mM TRIS, 15mM boric acid and 5mM β-cyclodextrin of pH* 8.5. The content of methanol in all electrolytes was 20 % (v/v). The two red wines analyzed were Cabernet Sauvignon (Moravské Vina_ské Závody Hukvaldy) and Taylor’s Port Special Ruby (Taylor, Fladgate&Yeatman, Portugal). The wines were diluted with water, the content of methanol was adjusted to 20% and IS was added and the samples were injected directly to the system. A single analysis took 45 min.
5. The on-line ITP-CZE was used for the separation and quantification of

selected flavonoids and phenolic acids in Hypericum perforatum leaves and flowers collected in six different localities in Slovak Republic. The LE in the ITP pre-separation step was 10mM HCl with TRIS as counterion (pH* 7.2). The TE was 50mM boric acid of pH* 8.2. The BGE in the electrophoretic step contained 25mM MOPSO, 50mM TRIS, 65mM boric acid, pH* 8.3. The content of methanol in all electrolytes was 20 % (v/v). The variability of the content of the active components depending on the place of collection was confirmed.