ABSTRACT

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Title of Doctoral Thesis **Analysis of biologically active compounds by capillary electrophoresis**

The thesis presented is dealing with the analysis of quaternary ammonium compounds of pharmaceutical importance by capillary electrophoresis (CE). Basic principles of CE and respective means of detection are discussed in the theoretical part. Special attention is paid to capacitively coupled contactless conductivity detection C4D and to the CE coupling with mass spectrometry (CE-MS). The chemical and pharmacological properties of the compounds of interest: carbethopendecinium bromide, pancuronium bromide (PM), vecuronium bromide (VM) and rocuronium bromide (RM) are characterized. The experimental work is focused on the development and validation of new analytical CE methods for the assay of such compounds. in pharmaceuticals. The C4D detection was applied because of poor UV adsorption capability of all compounds studied.

I. The first part deals with the CE analysis of septonex, an antiseptic drug with the character of surfactant. The background electrolyte was 30 mM MES of pH 7 containing 12.5 mg/ml of 2-hydroxypropyl-β-cyclodextrin and 20 % (v/v) of ACN as additives eliminating adsorption of the analyte on the inner capillary wall, and thus enabling regular separation.

II. The CE-C4D method for qualitative and quantitative analysis of muscle relaxants PM and VM is described in the second part. The analytes were separated in 50 mM borate buffer of pH 9.5 containing 12.5 mg/ml of 2-hydroxypropyl-γ-cyclodextrin as an additive. The stability of compounds during the sample preparation and analysis was examined and discussed.

III. The development of CE-C4D method for the sepatration of PM, VM, and RM and its validation is the objective of the third part of the thesis. The separation was realized in 30 mM acetate - ammoniacal buffer (pH 5.75) containing 20 mg/ml of 2-hydroxypropyl-γ-cyclodextrin as selector. Furthermore the strategy for the method development aimed to the assay of the muscle relaxants by CE coupled with tandem mass spectrometry with electrospray interface CE-ESI-MS/MS is described. The advantages and disadvantages of both methods are compared.