Abstract

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Title of the diploma thesis: Testing of potential capability of chiral ionic liquids with long alkyl chain in capillary electrophoresis chiral separations III

This diploma thesis builds on previous work which tested the chiral ionic liquid (-)-N-Dodecyl-N-methylephedrinium bromid (DMEB) for chiral separations in CE. This work focuses on finding a suitable internal standard and extraction procedure for the determination of levofloxacin in tablets. Due to a shortage of DMEB on the market, various extraction methods were verified using CE method employing sulfated β-cyclodextrin (S-β-CD). Separations were performed in fused silica capillaries (33 cm/24.5 cm) with an internal diameter of 50 µm, at voltage -13.6 kV and UV detection at 294 nm. Non-chiral enrofloxacin was chosen as suitable internal standard. The optimal sample preparation procedure for analysis involved the extraction of tablet in a solution of 20% acetonitrile with addition of 0.1 M NaOH using ultrasonication and subsequent centrifugation. Under these conditions, the determined levofloxacin content during indepedent assays over 4 different days was 101.88 ± 1.41% (n = 4). The extraction yield was tested at three concentration levels and the recovery values found were 95.66 ± 6.57 %; 97.94 ± 5.97 % and 98.72 ± 2.26 % (n = 3). Subsequently, the optimized sample preparation procedure was used for the determination of levofloxacin in tablets using the CE method with DMEB as the chiral selector. The background electrolyte was designed in the previous diploma thesis by Kateřina Müllerová: 20 mM tris buffer at pH 8.5 containing 100 mM DMEB. Separations were performed in fused silica capillaries (80.5 cm/72 cm). An internal standard gatifloxacin was replaced by the new internal standard enrofloxacin, which is significantly cheaper. The resolution between the peak of enrofloxacin and S-ofloxacin was 36.17. The method was linear for levofloxacin in the range of 10 – 100 µg/ml (r^2 = 0.9996). The determined levofloxacin content in tablets by this method was 95.21 ± 0.14 % (n = 3). The found levofloxacin content is lower than value found by the method using S-β-CD, due to the analysis of diffrent samples.