CM004

Evaluation of chiral stationary phases in the separation of the enantiomers of fexofenadine

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Introduction: Fexofenadine is commercially available as a racemic mixture of two pharmacologically active enantiomers and it can be found under the trade name Allegra® D. Studies have shown that the pharmacokinetics of fexofenadine is enantioselective with a plasma concentration of R-fexofenadine greater than the S-isomer. In the literature, there are only a few reports of enantioselective separation of fexofenadine using HPLC columns based on cyclodextrins. **Objective:** Thus, the aim of this work was to propose the separation of the fexofenadine enantiomers evaluating chiral columns based on polysaccharide and macrocyclic antibiotics. **Methods:** On chiral analysis by HPLC seven columns were evaluated (Chiralcel® OD-H, Chiralcel OJ®, Chiralpak® AS, Chiralpak® AD, Chiralpak AD-RH®, Lux® cellulose 1 and a Lux® cellulose 2), whose chiral stationary phase (FEQ) is based on polysaccharides, and a column (Chirobiotic V®) whose FEQ is based on a macrocyclic antibiotic vancomycin. The mobile phase used were acetonitrile, ethanol, methanol and water in polar organic mode and in reverse mode of elution in the presence or absence of acidic (acetic acid) and basic (triethylamine) additives alone or employing their mixtures. For all columns, the conditions evaluated initiated using mobile phase containing 100% of the organic solvent; then was tested with different ratios of the solvents, additives and also different flow rates of the mobile phase. The temperature of analysis was set at 23 ± ^{o}C. **Results:** Among all tested conditions and columns, the separation of the enantiomers of fexofenadine was successfully obtained in the following condition: chiral column Lux cellulose® 1 and water: methanol (35:65, v / v) + 0.3% triethylamine and 0.4% acetic acid as mobile phase at a flow rate of 0.6ml/min, with detection at 220 nm. Under these conditions, analysis time was less than 20 minutes and the resolution between the peaks of fexofenadine was 1,397. **Conclusion:** This result presents, for the first time, the resolution of the fexofenadine enantiomers using a FEQ based on polysaccharides.

Keywords: Chiral columns; Enantioselective analysis; HPLC; Fexofenadine.

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