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Separation of tramadol enantiomers by capillary electrophoresis using highly sulfated cyclodextrins

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Abstract:

In the pharmaceutical industry a continuing need for chiral resolution of drugs for various purposes and in diverse matrices exist. For these reasons, analysts may require a number of different separation systems capable of resolving a given pair of enantiomers. Highly sulfated cyclodextrins (HS-CDs) represent a relatively new class of chiral selectors in capillary electrophoresis (CE). In this investigation the use of HS-CDs as chiral selectors in CE for enantioseparation of tramadol, a highly potent analgesic, as the model drug and the influence of the type of selector and its concentration on enantiomeric resolution were studied. All of the available HSCDs (a ,b and g) could resolve tramadol enantiomers, but HS-g -CD showed better resolution and a baseline resolution was achieved with this selector even at a concentration as low as 0.5% w/v. Additionally, effect of the buffer pH on the enantioresolution was studied. At low pH buffers, in which electroosmotic flow is low in CE, the negatively charged selector prevented the cationic tramadol to migrate out of the capillary even after a long analysis time of 60 minutes. However, at higher pH values (pH=7 or more), the electroosmotic flow is high enough to drag drug-selector complex toward the detector and a reasonable of the enantiomers of the drug was achieved.

Keywords:

enantiomers ، separation ، capillary electrophoresis

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