

## **Abstract**

The following evaluation procedure was selected for the characterized ion-exchange column Phenosphere™ SCX. First of all, a set of biologically interesting analytes was selected. This set contained several basic drugs, specifically five tricyclic antidepressants (TCA), an anesthetic called procaine and a substance with antimalaric and antiarrhythmic effect – quinidine. For this set of basic substances were the separation conditions optimized on a characterized ion-exchange column Phenosphere™ SCX. The effect of the mobile phase composition on chromatographic behaviour of selected drugs was investigated, for instance the effect of used buffer and its concentration, buffer pH and the effect of addition of the organic modifier (in this case methanol). Under optimized chromatographic conditions for basic drugs analysis the ion-exchange column was characterized using LSER (Linear Solvation Energy Relationship). The chromatographic behaviour of the test substances with known molecular descriptors was found and then the multiple linear regression between retention factors of test substances and their molecular descriptors was done. The results of the multiple linear regression were discussed and then the interactions contributing to the analyte retention on the investigated cation-exchange column Phenosphere™ SCX were evaluated.

**Key words:** HPLC, ion-exchange chromatography, characterization, LSER, tricyclic antidepressants