

## **Abstract**

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**Title of Diploma Thesis:**

### **Comparison of two types of matrix effect evaluation for LC-MS/MS analysis**

This diploma thesis deals with a comparison of two methods of matrix effect evaluation in LC-MS/MS analysis using electrospray ionization and triple quadrupole. Specifically, it was a comparison of the method using slopes of a line of the calibration curves and the post-extraction addition method, where the main goal was to assess whether the obtained values of matrix effects correlate with each other or not. Where appropriate, to clarify the reasons for the different outcomes and define the conditions of both methods to obtain correct and accurate results. On the basis of physicochemical properties such as molecular weight, acid-base properties, and partition coefficient, a group of 28 diverse substances was selected. The actual evaluation of matrix effects was preceded by the selection of an appropriate LC method, optimization of the individual parameters of the ion source as well as the selection of appropriate SRM transition and collision energy for each substance. To evaluate the matrix effects, lyophilized serum was chosen as a matrix and protein precipitation with acetonitrile as a sample preparation technique.

Very diverse results have been obtained using both methods of evaluation, and therefore, when using slopes of a line of the calibration curves, various ways of constructing these calibration curves, such as logarithmic or reciprocal scaling, were also tested.