

Title: **Optimization of the chromatographic conditions for the separation of complex mixtures using a design of experiments strategy**

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Statistical experimental design is a very useful tool in the development and optimization of analytical methods. This design of experiments is essential when considering the application of the developed methods to fields that work with highly-complex samples, such as metabolomics, as is the case of this project.

In this work, an HILIC chromatographic method for nucleoside separation has been developed. Design of experiments has been used to obtain high-quality data providing information regarding the most relevant factors affecting the separation and to reduce the experimental effort compared with traditional methodologies.

In this project, the chromatographic optimal conditions for nucleosides separation have been achieved using a double experimental design: first a preliminary screening design, and then an optimization design.

Finally, the performance of the developed chromatographic method has been tested in the determination of nucleosides in some infant formula samples.

Keywords: statistical design of experiments, HILIC, nucleosides, screening, optimization.