

Summary

High-performance liquid chromatography is one of the most popular analytical technique used in many laboratories around the world. Many scientists are interested in hydrogen sulfide and its impact on the functioning of the human body. This prompts of researchers to develop new, less complex methods for determining the concentration of this compound in tissues. It is important to maintain high precision and accuracy of measurements, which at the same time will have low limits of quantification.

This PhD thesis is divided into two main parts. The first part is an overview of current literature about biologically available forms of hydrogen sulfide and its metabolism in the human body. This part also contains information about determination methods of hydrogen sulfide and its forms using the HPLC technique, which have been described since 2010 to 2017. The second part of the dissertation is a description of the conducted experiments, results obtained during the research and their discussion.

The chapter: *Reagents and apparatus* contains information about the reagents, description of solution preparation and the equipment used during the experiments.

The chapter: *Research methodology* includes three subsections, in which a detailed description of new analytical methods for determination of selected sulfur compounds in plant tissues and in urine developed during experiments can be found.

The chapter: *Results and discussion* is divided into four parts, which contains the results of the research and their discussion. The first part includes the optimization of procedures for the determination of sulfane sulfur in vegetables. The second part concerns elaboration procedure for acid-labile sulfur determination in vegetables and fruits. The next part of this chapter presents the optimization of the procedure for the determination of thiosulphates in cruciferous vegetables. This chapter encompasses also optimization of sample preparation for analysis, validation of the methods and its application to real samples. The fourth part of this chapter is a description and presentation of the results obtained during research aimed at determining the correlation between various forms of sulfur in the urine of people who had a diet rich in cruciferous vegetables.

The last part the PhD thesis includes a summary of the obtained results, conclusions, and a list of cited literature.