

MULTICOMMUTED FLOW INJECTION SYSTEM WITH HGAAS FOR THE DETERMINATION OF SELENIUM IN FOODSTUFFS AND ENVIRONMENTAL SAMPLES

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Selenium and its compounds can be found in the environment and in foodstuffs. It is nutritionally important mainly due to its antioxidant and anticarcinogenic properties but it can be toxic for human health.

A flow system based on the multicommutated flow injection analysis (MCFIA) was developed for the determination of total selenium by hydride generation atomic absorption spectrophotometry (HGAAS). The system uses three independently controlled solenoid valves for the introduction of reagents and samples. One advantage of the developed MCFIA system concerns the reduction of waste production (less than 6.4 ml/assay) and reagent consumption which contribute to a greener chemistry. Linear calibration curve was established up to $10 \mu\text{g l}^{-1}$, the determination throughput was 116 h^{-1} and the repeatability was better than 3% (RSD, $n=10$ for a sample with $2.8 \mu\text{g l}^{-1}$). The developed system was applied to the analysis of foodstuffs and environmental samples. Accuracy of the method was assessed by recovery studies using the certified reference materials CRM 186 (pig kidney), CRM 185 (bovine liver), CRM 279 (sea lettuce), NCR DORM-2 (dog fish) and also water reference material from interlaboratory proficiency tests. The average of the results obtained for each reference material for total selenium lies within the interval at 95% confidence level, showing no statistical evidence that the results are different which confirmed the validity of the developed method.

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