ANALÍTICA 2016

8TH MEETING OF THE ANALYTICAL CHEMISTRY DIVISION OF THE PORTUGUESE CHEMICAL SOCIETY

Book of Abstracts

SOCIEDADE PORTUGUESA DE QUÍMICA

LISBON - PORTUGAL

6 – 7 JUNE 2016

P-34

A SOLID PHASE EXTRACTION FLOW INJECTION METHODOLOGY WITH SPECTROPHOTOMETRIC DETECTION FOR THE ZINC DETERMINATION IN PLANT DIGESTS

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Zinc plays an important role in plant metabolism; the most significant is its activity as component of various enzymes. However, it is very toxic at high concentrations. Its concentration is related with the chemical composition of the growth media [1]. Zinc is widely used in many industries and this way it is introduced in the environment.
Several methods are available for zinc determination in plants digests, such as Atomic Absorption Spectrometry (AAS) or Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES). These methods present high selectivity and low limits of detection. However, also presents some limitations, such as relatively high equipment cost and consumption of toxic gases [2].
In this work, a flow injection methodology displaying analyte enrichment and spectrophotometric detection for the zinc determination in plant digests is described. The method is based on a solid phase extraction for zinc preconcentration and removal of some interferences, and the colorimetric determination involving Zincon. To implement this approach, an injector commutator and a multi-reflection flow cell were used.
The developed system provides a simple and reliable determination of zinc in plants, with a limit of detection of 0.04 mg/L. When applied to plants digests the results were in agreement with those obtained with reference procedure (AAS).

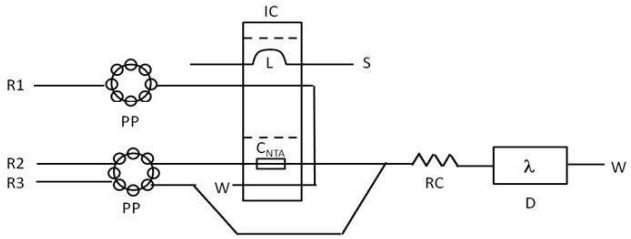

Figure 1: Flow injection manifold for the Zn determination in plants digests. S – Sample/Standard solution; R1 – ultrapure water; R2 – HNO_3, R3 - Zincon; PP – Peristaltic pump; IC – Injector commutator; L – loop; C_{NTA} – NTA column; RC – Reaction coil; D – detector; W - waste

Acknowledgements: T.C.F. Ribas thanks to Fundação para a Ciência e a Tecnologia (FCT, Portugal) and Fundo Social Europeu for the Grant SFRH/BD/91820/2012. This work was also supported by National Funds from FCT – Fundação para a Ciência e a Tecnologia through the projects PTDC/AAG-MAA/5887/2014 and UID/Multi/50016/2013.

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