



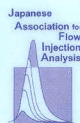
18th ICFIA

INTERNATIONAL
CONFERENCE ON
FLOW INJECTION
ANALYSIS

15 - 20 SEPTEMBER 2013

PORTO, PORTUGAL

INSTITUTIONAL SPONSORS



18th ICFIA

INTERNATIONAL
CONFERENCE ON
FLOW INJECTION
ANALYSIS

15 - 20 SEPTEMBER 2013

PORTO, PORTUGAL

www.spq.pt/eventos/icfia

18th ICFIA- International Conference on Flow Injection Analysis
Porto, Portugal, 15 -20 September, 2013

BOOK OF ABSTRACTS

Escola Superior de Biotecnologia, Universidade Católica Portuguesa (ESB-UCP)
Faculdade de Farmácia, Universidade do Porto (FF-UP)
Sociedade Portuguesa de Química (SPQ)
Japanese Association for Flow Injection Analysis (JAFIA)

Porto, 2013

EDITORIAL BOARD

António Rangel
Marcela Segundo
Ildikó Tóth

TYPESET AND GRAPHIC DESIGN

Joana Macedo, FFUP

ALL RIGHTS RESERVED

No part of this publication may be reproduced without prior permission from
the editorial board

PRINTED IN PORTUGAL:

ISBN: 978-989-98541-0-9

Printed by Sersilito Lda.



IRON SPECIATION IN BATHING WATERS USING SEQUENTIAL INJECTION LAB-ON-VALVE (SI-LOV) SOLID-PHASE SPECTROPHOTOMETRY

Ruth SUÁREZ¹, Raquel B. R. Mesquita^{2,3}, Maria Rangel⁴, Adriano A. Bordalo³, Víctor Cerdà¹, António O. S. S. Rangel²

¹ *Laboratory of Environmental Analytical Chemistry – LQA2, University of the Balearic Islands, Palma de Mallorca, Spain*

² *CBQF - Centro de Biotecnologia e Química Fina – Laboratório Associado, Escola Superior de Biotecnologia, Universidade Católica Portuguesa/Porto, Porto, Portugal*

³ *Laboratory of Hydrobiology, Institute of Biomedical Sciences Abel Salazar (ICBAS) and Institute of Marine Research (CIIMAR), Universidade do Porto, Portugal*

⁴ *REQUIMTE, Instituto de Ciências Biomédicas de Abel Salazar, Universidade do Porto, Portugal*

The development of a green analytical method based on sequential injection lab-on-valve (SI-LOV) solid-phase spectrophotometry for iron speciation in bathing water samples is described. The spectrophotometric detection was based on the colorimetric reaction between iron(III) and the non-toxic reagent 3-hydroxy-4-pyridinone (3,4-HPO) chelator, which was previously described as an effective alternative for the determination of iron [1]. To achieve a suitable limit of detection, a pre-concentration step was included using the Nitrilotriacetic Acid Superflow (NTA) resin. The NTA resin was placed in the flow cell for assembling the preconcentration column where iron was retained prior to the reaction with 3,4-HPO. Thus, the change of absorbance was monitored at 460 nm, corresponding to the complex formation. With this approach, both the low levels of iron in natural waters, and minimization of the high salinity interference in coastal water samples were attained. The developed method enabled a limit of detection of 13 $\mu\text{g Fe L}^{-1}$ with a linear range between 20 - 100 $\mu\text{g Fe L}^{-1}$, with low sample consumption and effluent production, 400 μL and 2.15 mL respectively. The proposed method was effectively applied to the speciation of iron in different bathing waters, coastal and inland.

Acknowledgements: R. Suárez and R. B. R. Mesquita thank to Ministerio de Educación Cultura e Deporte for the grant MHE2011-00034 and to Fundação para a Ciência e a Tecnologia (FCT) e Fundo Social Europeu through the program POPH – QREN for the grant SFRH/BPD/41859/2007,

respectively. R. Suárez and V. Cerdà acknowledge financial support from Ministerio de Ciencia e Innovación through Project CTQ2010-15541 and from Conselleria d'Economia, Hisenda, i Innovació of the Government of the Balearic Islands through the allowance to competitive groups (43/2011). This work was supported by National Funds through FCT the projects PEst-C/EQB/LA0016/2011 and PEst-C/EQB/LA0006/2011 and European Union FEDER funds through COMPETE and by projects PTDC/AAC-AMB/104882/2008 and PTDC/AAG-MAA/3978/2012.

P

References

- [1] R.B.R. Mesquita, R. Suárez, V. Cerdà, M. Rangel, A.O.S.S. Rangel, *Talanta*, 2013, 108, 38-45.