

IN THIS ISSUE

ISSN 0267-9477 CODEN JASPE2 38(5) 965–1174 (2023)



Cover

See Jiaming Li *et al.*, pp. 1032–1042. Image reproduced by permission of Jiaming Li from *J. Anal. At. Spectrom.*, 2023, **38**, 1032.



Inside cover

See Kerstin Leopold, Henning Bruhn *et al.*, pp. 1021–1031. Image reproduced by permission of Kerstin Leopold from *J. Anal. At. Spectrom.*, 2023, **38**, 1021.

ATOMIC SPECTROMETRY UPDATES

974

Atomic spectrometry update: review of advances in atomic spectrometry and related techniques

E. Hywel Evans,* Jorge Pisonero, Clare M. M. Smith and Rex N. Taylor

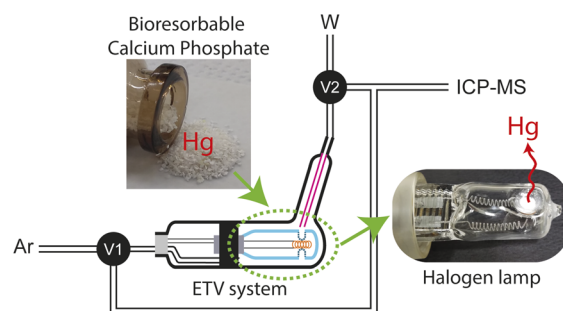


TECHNICAL NOTES

1000

Mercury determination in bioresorbable calcium phosphate using a new electrothermal vaporization system coupled to ICP-MS

Jussiane S. Silva,* Graciela M. Heidrich, Bruno O. Poletto, Jose N. G. Paniz, Valderi L. Dressler and Erico M. M. Flores



Editorial Staff

Executive Editor

Philippa Ross

Deputy Editor

Alice Smallwood

Editorial Production Manager

Jason Woolford

Development Editor

Celeste Brady

Publishing Editors

Gabriel Clarke, Derya Kara-Fisher, Ziva Whitelock

Publishing Assistant

Andrea Whiteside

Editorial Assistant

Leo Curtis

Publisher

Jeanne Andres

For queries about submitted articles please contact Jason Woolford, Editorial production manager, in the first instance. E-mail jaas@rsc.org

For pre-submission queries please contact

Philippa Ross, Executive editor.

E-mail jaas-rsc@rsc.org

Journal of Analytical Atomic Spectrometry (JAAS) (electronic: ISSN 1364-5544) is published 12 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF.

All orders, with cheques made payable to the Royal Society of Chemistry, should be sent to the Royal Society of Chemistry Order Department, Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, CB4 0WF, UK

Tel +44 (0)1223 432398; E-mail orders@rsc.org

2023 Annual (electronic) subscription price: £2531; US\$3447.

Customers in Canada will be subject to a surcharge to cover GST. Customers in the EU subscribing to the electronic version only will be charged VAT.

If you take an institutional subscription to any Royal Society of Chemistry journal you are entitled to free, site-wide web access to that journal. You can arrange access via Internet Protocol (IP) address at www.rsc.org/ip

Customers should make payments by cheque in sterling payable on a UK clearing bank or in US dollars payable on a US clearing bank.

Whilst this material has been produced with all due care, the Royal Society of Chemistry cannot be held responsible or liable for its accuracy and completeness, nor for any consequences arising from any errors or the use of the information contained in this publication. The publication of advertisements does not constitute any endorsement by the Royal Society of Chemistry or Authors of any products advertised. The views and opinions advanced by contributors do not necessarily reflect those of the Royal Society of Chemistry which shall not be liable for any resulting loss or damage arising as a result of reliance upon this material. The Royal Society of Chemistry is a charity, registered in England and Wales, Number 207890, and a company incorporated in England by Royal Charter (Registered No. RC000524), registered office: Burlington House, Piccadilly, London W1J 0BA, UK, Telephone: +44 (0) 207 4378 6556.

Advertisement sales:

Tel +44 (0) 1223 432246; Fax +44 (0) 1223 426017;

E-mail advertising@rsc.org

For marketing opportunities relating to this journal, contact marketing@rsc.org

JAAS

Journal of Analytical Atomic Spectrometry

rsc.li/jaas

Innovative research on the fundamental theory and application of spectrometric techniques.

Editorial Board

Chair

Heidi Goenaga-Infante, LGC, Middlesex

Members

Márcia Foster Mesko, Universidade Federal de Pelotas, Brazil

Gerardo Gamez, Texas Tech University, USA

Steve Hill, University of Plymouth, UK

Xiangeng Hou, Sichuan University, China

Bin Hu, Wuhan University, China

Björn Meermann, BAM, Germany

José Luis Todolí, University of Alicante, Spain

Frank Vanhaecke, University of Ghent,

Belgium

Vassilia Zorba, Lawrence Berkeley National

Laboratory, USA

Advisory Board

Marco Aurelio Zezzi Arruda, UNICAMP, Brazil

Ramon M. Barnes, University Research

Institute for Analytical Chemistry, USA

Mathieu Baudelet, University of Central

Florida, USA

Annie Bogaerts, University of Antwerp,

Belgium

José Broekaert, University of Hamburg,

Germany

Marta Costas-Rodríguez, Ghent University,

Belgium

George Donati, Wake Forest University, USA

Carsten Engelhard, University of Siegen,

Germany

Joerg Feldmann, University of Graz, Austria

Alexander Gundlach-Graham, Iowa State

University, USA

Detlef Günther, ETH Zürich, Switzerland

Wei Hang, Xiamen University, China

Gary M. Hieftje, Indiana University, USA

Takafumi Hirata, University of Tokyo, Japan

Zhaochu Hu, China University of Geosciences, China

Norbert Jakubowski, Federal Institute for

Materials Research and Testing, Germany

Gunda Köllensperger, University of Vienna,

Austria

David W. Koppenaal, Pacific Northwest

National Laboratory, USA

Kerstin Leopold, University of Ulm, Germany

Kelvin Leung, Hong Kong Baptist University,

Hong Kong, China

Lara Lobo, University of Oviedo, Spain

Yi Lv, Sichuan University, China

R. Kenneth Marcus, Clemson University, USA

Érico Marlon Moraes Flores, Universidade

Vincent Motto-Ros, Claude Bernard University

Lyon 1, France

Sohail Mushtaq, University of Bristol, UK

John W Olesik, Ohio State University, USA

Christophe Pécheyran, University of Pau and

Pays de l'Adour, France

Spiros Pergantis, University of Crete, Greece

Jorge Pisonero, University of Oviedo, Spain

Steven Ray, State University of New York at Buffalo, USA

Mark Rehlkamp, Imperial College London,

UK

Martín Resano, University of Zaragoza, Spain

Jacob Shelley, Rensselaer Polytechnic Institute,

USA

Patricia Smichowski, National Atomic Energy

Commission, Argentina

Ralph E. Sturgeon, National Research Council

of Canada, Canada

Joanna Szpunar, CNRS EP 132, France

Johannes van Elteren, National Institute of

Chemistry, Slovenia

Lu Yang, National Research Council Canada,

Canada

Atomic Spectrometry Updates Editorial Board

J R Bacon, University of Strathclyde, UK

N Barlow, Sandwell General Hospital, UK

S Branch, Herbalife, UK

O Butler, Health & Safety Laboratory Buxton,

UK

W R L Cairns, Institute for the Dynamics

of Environmental Processes of the Italian

CNR, Italy

S Carter, INEOS, UK

M R Cave, British Geological Survey, UK

O Cavoura, University of West Attica, Greece

R Clough, University of Plymouth, UK

J M Cook, British Geological Survey, UK

A Cross, Reading Scientific Service Limited

(RSSI), UK

C M Davidson, University of Strathclyde, UK

L Ebdon, UK

H Evans, University of Plymouth, UK

A Fisher, University of Plymouth, UK

U Fittschen, Technical University of Clausthal,

Germany

M Foulkes, University of Plymouth, UK

B Gibson, Intertek Sunbury, UK

C Harrington, SAS Trace Element Laboratory,

Surrey Pathology Services, UK

S Hill, LGC, UK

S J Hill, University of Plymouth, UK

Y Madrid, Universidad Complutense de

Madrid, Spain

R Mertz-Kraus, Johannes Gutenberg-

Universität Mainz, Germany

M Patriarca, Istituto Superiore di Sanita, Italy

J Pisonero, University of Oviedo, Spain

A Robson, Manchester University NHS

Foundation Trust, UK

B Russell, National Physical Laboratory, UK

M Sargent, LGC, UK

C M M Smith, St Ambrose High School, UK

A Taylor, Royal Surrey County Hospital, UK

R Taylor, University of Southampton, UK

J F Tyson, University of Massachusetts, USA

C Vanhoof, Flemish Institute for Technological

Research (VITO), Belgium

L Vince, Ghent University, Belgium

M White, Health & Safety Laboratory, UK

*Members of the ASU Executive Committee

Information for Authors

Full details on how to submit material for publication in JAAS are given in the Instructions for Authors (available from <http://www.rsc.org/authors>). Submissions should be made via the journal's homepage: rsc.li/jaas

Authors may reproduce/republish portions of their published contribution without seeking permission from the Royal Society of Chemistry, provided that any such republication is accompanied by an acknowledgement in the form: (Original Citation)–Reproduced by permission of the Royal Society of Chemistry.

This journal is © The Royal Society of Chemistry 2023.

Apart from fair dealing for the purposes of research or private study for non-commercial purposes, or criticism or review, as permitted under the Copyright, Designs and Patents Act 1988 and the Copyright and Related Rights Regulation 2003, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the Publishers or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency in the UK. US copyright law is applicable to users in the USA.

Registered charity number: 207890



Determination of trace elements in mineral water by MIP OES using the Marin-5 nebulization system

```

graph LR
    SI[Sample input] --> HNC(Heated nebulization chamber)
    AN[Ar or N2 input] --> HNC
    HNC --> C[Condenser]
    C --> OES(touch ICP OES or MIP OES)
    OES --> CAS[Computer analytics software]
    style OES fill:#d3d3d3
    style CAS fill:#d3d3d3
  
```

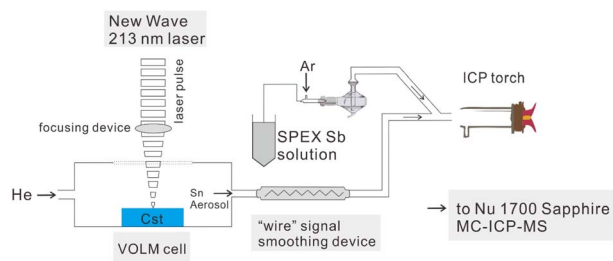
1016

1021

1032

This journal is © The Royal Society of Chemistry 2023

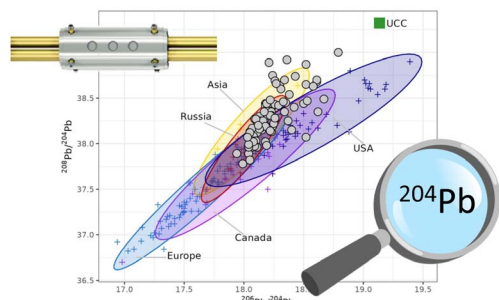
1043



In situ Sn isotope analysis of cassiterite (SnO₂) by nanosecond laser ablation MC-ICP-MS

Jia-Xin She, Weiqiang Li,* Shichao An, Tao Yang and Rongqing Zhang

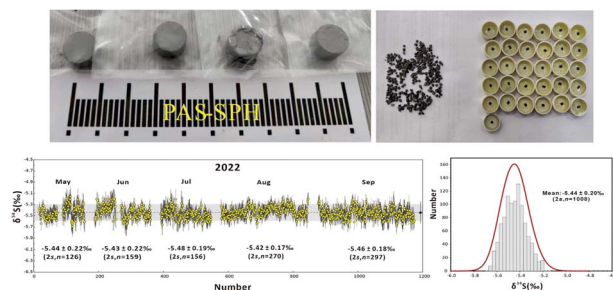
1057



Precise determination of ²⁰⁴Pb-based isotopic ratios in environmental samples by quadrupole inductively coupled plasma mass spectrometry

Marco Grotti,* Maria Alessia Vecchio, Dalia Gobbato, Matilde Mataloni and Francisco Ardini

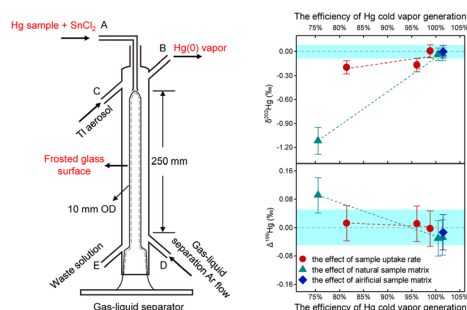
1065



A newly synthesized reference material for *in situ* sulfur isotope measurement of sphalerite using laser ablation MC-ICP-MS

Xiaojuan Nie, Zhian Bao, Chunlei Zong, Nan Lv, Kaiyun Chen and Honglin Yuan*

1076



The efficiency of Hg cold vapor generation and its influence on Hg isotope analysis by MC-ICP-MS

Miao Shi, Bridget A. Bergquist, Anwen Zhou, Yaqiu Zhao, Ruoyu Sun, Jiubin Chen and Wang Zheng*

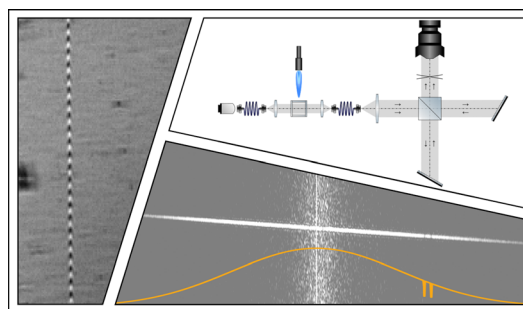


PAPERS

1088

Determination of broadband-light atomic absorption through interferometric spectrometry with a spatial heterodyne spectrometer

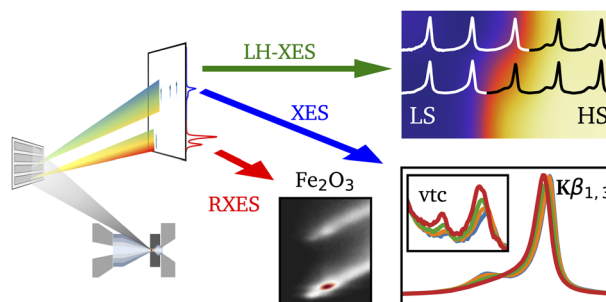
Xunyu Li, Jens Riedel and Yi You*



1097

High-efficiency X-ray emission spectroscopy of cold-compressed Fe₂O₃ and laser-heated pressurized FeCO₃ using a von Hámos spectrometer

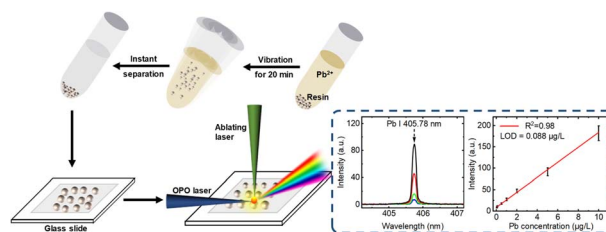
Christian Albers,* Robin Sakrowski, Nicola Thiering, Lélia Libon, Georg Spiekermann, Johannes M. Kaa, Hlynur Gretarsson, Martin Sundermann, Metin Tolan, Max Wilke and Christian Sternemann*



1108

Detection of lead in water at ppt levels using resin-enrichment combined with LIBS-LIF

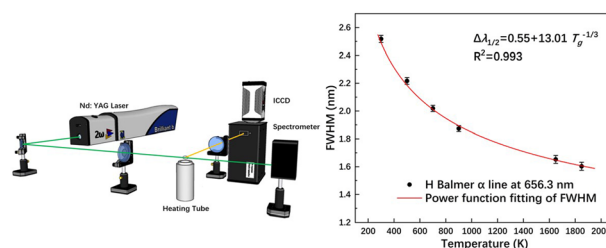
Xuelin Wen, Zhenlin Hu, Junfei Nie, Zhen Gao, Deng Zhang, Lianbo Guo,* Shixiang Ma* and Daming Dong



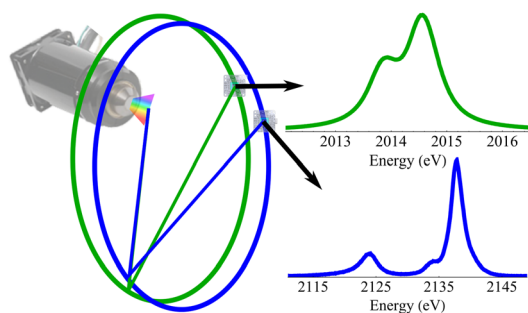
1116

Gas temperature measurement by atomic line broadening using the LIBS technique

Ercong Gao, Renmin Wei, Dayuan Zhang, Zhifeng Zhu, Qiang Gao* and Bo Li



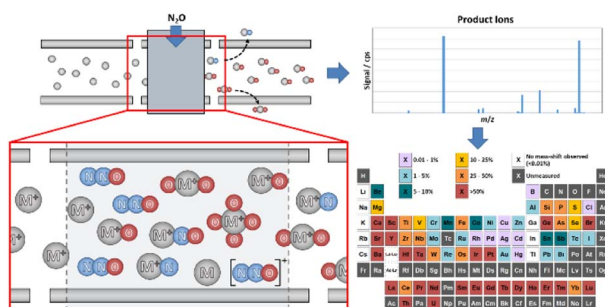
1125



A laboratory X-ray emission spectrometer for phosphorus $K\alpha$ and $K\beta$ study of air-sensitive samples

Jared E. Abramson, William M. Holden, Ricardo A. Rivera-Maldonado, Alexandra Velian, Brandi M. Cossairt and Gerald T. Seidler*

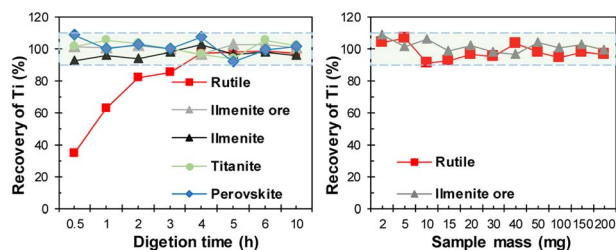
1135



Characterisation of gas cell reactions for 70+ elements using N_2O for ICP tandem mass spectrometry measurements

Shaun T. Lancaster,* Thomas Prohaska and Johanna Irrgeher

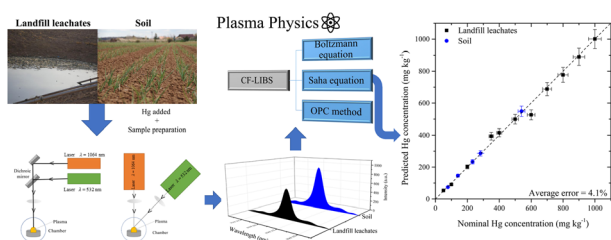
1146



Evaluation of the digestion capability of ammonium bifluoride for the determination of major and trace elements in Ti-rich minerals by ICP-MS

Hong Liu, Zhaochu Hu,* Tao He, Wen Zhang, Keqing Zong, Tao Luo, Xiaoyun Qiu, Yang Gao and Mufei Li

1155



Application of one-point calibration LIBS for quantification of analytes in samples with distinct matrix characteristics: a case study with Hg

Luís Carlos Leva Borduchi, Carlos Renato Menegatti, Débora Marcondes Bastos Pereira Milori, Hécio José Izário Filho and Paulino Ribeiro Villas-Boas*



1164

A parallel-beam wavelength-dispersive X-ray emission spectrometer for high energy resolution in-air micro-PIXE analysis

K. Isaković, M. Petric, A. Rajh, Z. Rupnik, M. Ribič, K. Bučar, P. Pelicon, P. Pongrac, V. Bočaj and M. Kavčič*

