

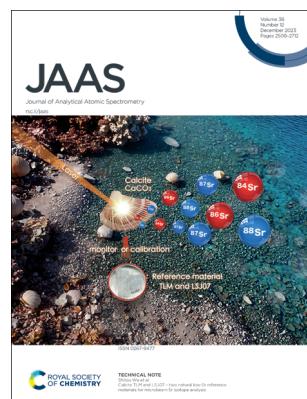
### IN THIS ISSUE

ISSN 0267-9477 CODEN JASPE2 38(12) 2509–2712 (2023)



#### Cover

See Zongyu Hou, Zhe Wang et al., pp. 2554–2561. Image reproduced by permission of Zhe Wang from *J. Anal. At. Spectrom.*, 2023, **38**, 2554.



#### Inside cover

See Shitou Wu et al., pp. 2528–2537. Image reproduced by permission of Shitou Wu from *J. Anal. At. Spectrom.*, 2023, **38**, 2528.

### PERSPECTIVE

2518

#### Swimming against the current – sacrificing unit mass resolution in ICP-MS to improve figures of merit

David Clases

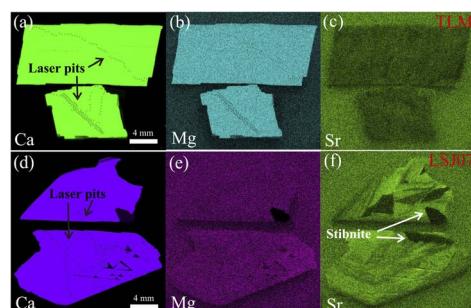


### TECHNICAL NOTES

2528

#### Calcite TLM and LSJ07 – two natural low-Sr reference materials for microbeam Sr isotope analysis

Shitou Wu,\* Yuehang Yang, Tianyi Li, Chao Huang, Zhian Bao, Youlian Li, Chaofeng Li, Lei Xu, Hao Wang, Liewen Xie, Jinhui Yang and Fuyuan Wu



**Editorial Staff****Executive Editor**

Rebecca Garton

**Deputy Editor**

Alice Smallwood

**Editorial Production Manager**

Sarah Whitehouse

**Development Editor**

Celeste Brady

**Publishing Editors**Gabriel Clarke, Derya Kara-Fisher,  
Emma Stephen, Ziva Whitelock**Publishing Assistant**

Andrea Whiteside

**Editorial Assistant**

Leo Curtis

**Publisher**

Jeanne Andres

For queries about submitted articles please contact  
Sarah Whitehouse, Editorial production manager, in the  
first instance. E-mail [jaas@rsc.org](mailto:jaas@rsc.org)

For pre-submission queries please contact  
Rebecca Garton, Executive editor.  
E-mail [jaas-rsc@rsc.org](mailto: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](mailto: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](http://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](mailto:advertising@rsc.org)

For marketing opportunities relating to this journal,  
contact [marketing@rsc.org](mailto:marketing@rsc.org)

**JAAS**

Journal of Analytical Atomic Spectrometry

[rsc.li/jaas](http://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

Xiangdeng Hou, Sichuan University, China  
Bin Hu, Wuhan University, China  
Björn Meermann, BAM, GermanyJosé Luis Todoli, University of Alicante, Spain  
Frank Vanhaecke, University of Ghent,  
Belgium  
Vassilia Zorba, Lawrence Berkeley National  
Laboratory, USA**Advisory Board**

Marco Aurelio Zerzi Arruda, UNICAMP, Brazil	Zhaochu Hu, China University of Geosciences, China	Spiros Pergantis, University of Crete, Greece
Ramon M. Barnes, University Research Institute for Analytical Chemistry, USA	Norbert Jakubowski, Federal Institute for Materials Research and Testing, Germany	Jorge Pisonero, University of Oviedo, Spain
Mathieu Baudelet, University of Central Florida, USA	Gunda Köllensperger, University of Vienna, Austria	Steven Ray, State University of New York at Buffalo, USA
Annette Bogaerts, University of Antwerp, Belgium	David W. Koppenaal, Pacific Northwest National Laboratory, USA	Mark Rehkamper, Imperial College London, UK
José Broekaert, University of Hamburg, Germany	Kerstin Leopold, University of Ulm, Germany	Martín Resano, University of Zaragoza, Spain
Marta Costas-Rodríguez, Ghent University, Belgium	Kelvin Leung, Hong Kong Baptist University, Hong Kong, China	Jacob Shelley, Rensselaer Polytechnic Institute, USA
George Donati, Wake Forest University, USA	Lara Lobo, University of Oviedo, Spain	Patricia Smichowski, National Atomic Energy Commission, Argentina
Carsten Engelhard, University of Siegen, Germany	Yi Lv, Sichuan University, China	Ralph E. Sturgeon, National Research Council of Canada, Canada
Joerg Feldmann, University of Graz, Austria	R. Kenneth Marcus, Clemson University, USA	Joanna Szpunar, CNRS EP 132, France
Alexander Gundlach-Graham, Iowa State University, USA	Érico Marlon Moraes Flores, Universidade Vincente Motto-Ros, Claude Bernard University Lyon 1, France	Johannes van Elteren, National Institute of Chemistry, Slovenia
Detlef Günther, ETH Zürich, Switzerland	Sohail Mushtaq, University of Bristol, UK	Lu Yang, National Research Council Canada, Canada
Wei Hang, Xiamen University, China	John W Olesik, Ohio State University, USA	
Gary M. Hietfje, Indiana University, USA	Christophe Pêcheur, University of Pau and Pays de l'Adour, France	

**Atomic Spectrometry Updates Editorial Board**

J R Bacon, University of Strathclyde, UK	L Ebdon, UK	J Pisonero, University of Oviedo, Spain
N Barlow, Sandwell General Hospital, UK	H Evans, University of Plymouth, UK	A Robson, Manchester University NHS Foundation Trust, UK
S Branch, Herbalife, UK	A Fisher, University of Plymouth, UK	B Russell, National Physical Laboratory, UK
O Butler, Health & Safety Laboratory Buxton, UK	U Fittschen, Technical University of Clausthal, Germany	M Sargent, LGC, UK
W R L Cairns, Institute for the Dynamics of Environmental Processes of the Italian CNR, Italy	M Foulkes, University of Plymouth, UK	C M M Smith, St Ambrose High School, UK
S Carter, INEOS, UK	B Gibson, Intertek Sunbury, UK	A Taylor, Royal Surrey County Hospital, UK
M R Cave, British Geological Survey, UK	C Harrington, SAS Trace Element Laboratory, Surrey Pathology Services, UK	R Taylor, University of Southampton, UK
O Cavoura, University of West Attica, Greece	S Hill, LGC, UK	J F Tyson, University of Massachusetts, USA
R Clough, University of Plymouth, UK	SJ Hill, University of Plymouth, UK	C Vanhoof, Flemish Institute for Technological Research (VITO), Belgium
J M Cook, British Geological Survey, UK	Y Madrid, Universidad Complutense de Madrid, Spain	L Vincze, Ghent University, Belgium
A Cross, Reading Scientific Service Limited (RSSL), UK	R Mertz-Kraus, Johannes Gutenberg-Universität Mainz, Germany	M White, Health & Safety Laboratory, UK
C M Davidson, University of Strathclyde, UK	M Patriarca, Istituto Superiore di Sanita, Italy	

\*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](http://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



## TECHNICAL NOTES

2538

**Automated standard dilution analysis using a four-port switching valve for fast inductively coupled plasma optical emission spectrometry determination**

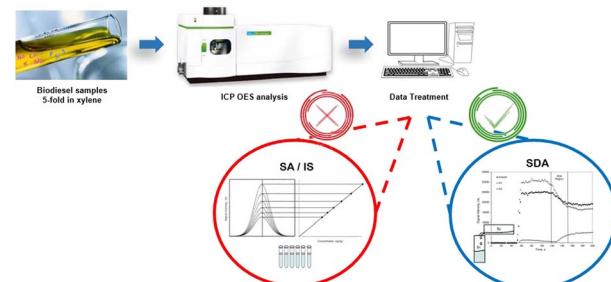
Jesse R. Ingham, Bradley T. Jones and George L. Donati\*



2547

**Standard dilution analysis (SDA) as a powerful tool for elemental determination in biodiesel by inductively coupled plasma optical emission spectrometry (ICP OES)**

Vitor Corraqui P. Marrocos,\* Jefferson R. de Souza and Tatiana D. Saint Pierre

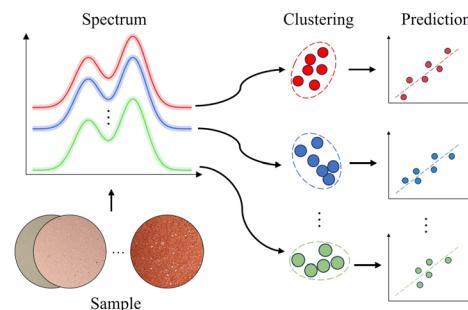


## PAPERS

2554

**Improving quantitative analysis of cement elements in laser-induced breakdown spectroscopy through combining matrix matching with regression**

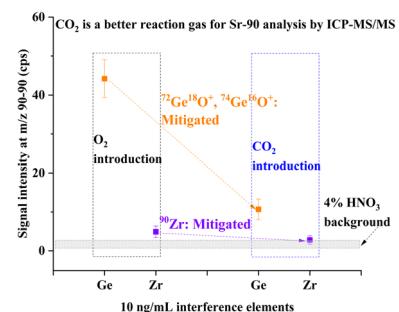
Chenwei Zhang, Weiran Song, Zongyu Hou\* and Zhe Wang\*



2562

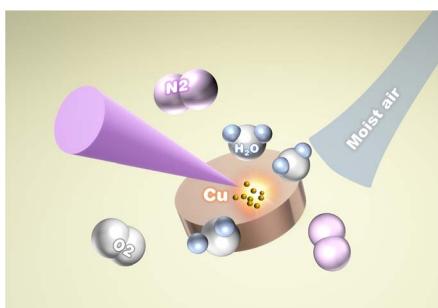
 **$^{90}\text{Sr}$  bioassay in small-volume urine by ICP-MS/MS with  $\text{CO}_2$  as the reaction gas**

Guosheng Yang,\* Hirofumi Tazoe, Eunjoo Kim, Jian Zheng, Munehiko Kowatari and Osamu Kurihara



## PAPERS

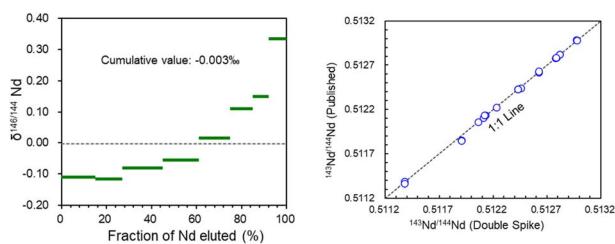
2571



## The influences of ambient humidity on laser-induced breakdown spectroscopy

Jiacen Liu, Zongyu Hou\* and Zhe Wang\*

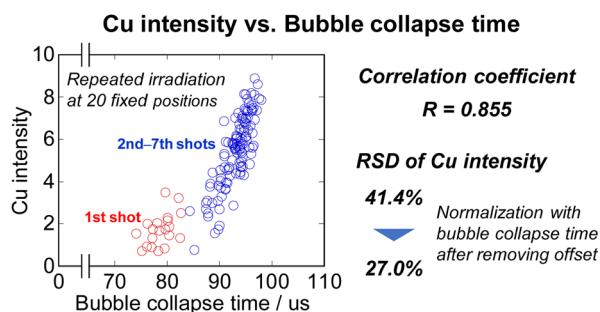
2581



## Simultaneously obtaining stable and radiogenic Nd isotope ratios through a single DGA column using double spike TIMS

Fang Liu,\* Xin Li,\* Hong Yang, Qingyao Peng, Jiaoqiao Wu and Zhaofeng Zhang

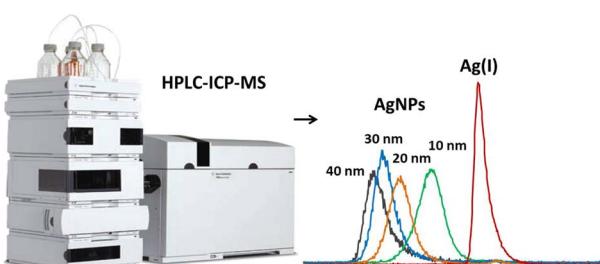
2590



## Effect of repeated irradiation on laser-induced breakdown spectroscopy of copper immersed in a sodium chloride aqueous solution and normalization with bubble collapse time

Ayumu Matsumoto,\* Yusuke Shimazu, Shinji Yae and Tetsuo Sakka

2598



## Selection of chromatographic separation conditions for reliable monitoring of the transformation of AgNPs/Ag(I) species by HPLC-ICP-MS in surface water and green algae cells

Julita Malejko, Weronika Liszewska and Beata Godlewska-Żytkiewicz\*

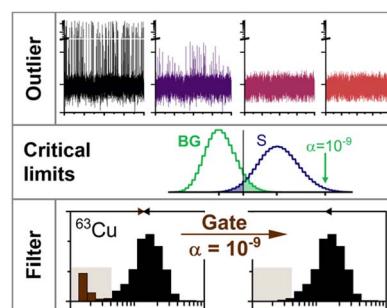


## PAPERS

2607

## Improving detection thresholds and robust event filtering in single-particle and single-cell ICP-MS analysis

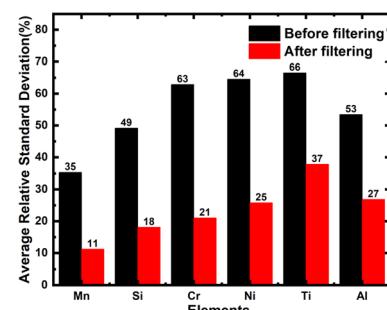
Matthias Elinkmann,\* Sarah Reuter, Michael Holtkamp, Steffen Heuckeroth, Alexander Köhrer, Katharina Kronenberg, Michael Sperling, Oliver Rubner, C. Derrick Quarles, Jr, Michael Hippler and Uwe Karst



2619

## Long-term reproducibility detection method for quantitative LIBS using Kalman filtering

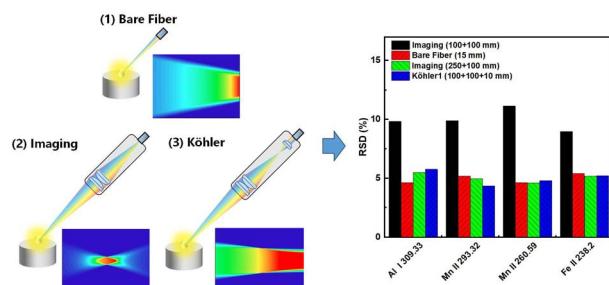
Ying Lu, Li Liu, Zechuan Wu, Zhishuai Xu, Ziyi Zhao, Zhongqi Hao,\* Jiulin Shi and Xingdao He



2625

## Spectral stability improvement through wide fields of view collection optics in laser-induced breakdown spectroscopy applications

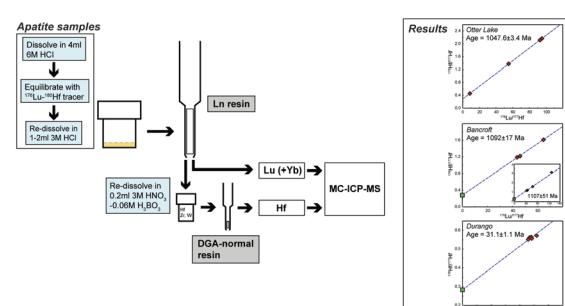
Guangda Wang, Ying Zeng, Lianbo Guo,\* Shenglin Li and Zhenlin Hu\*



2636

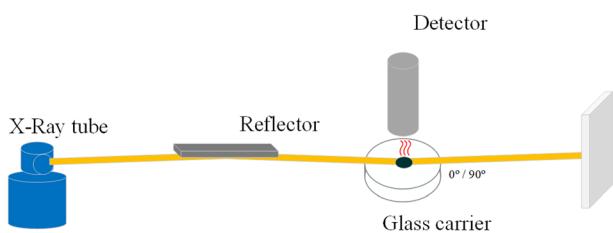
## An optimized chromatography method and MC-ICP-MS technique for apatite Lu-Hf geochronology

Chao Zhang,\* Tsai-Wei Chen and Jeffrey D. Vervoort



## PAPERS

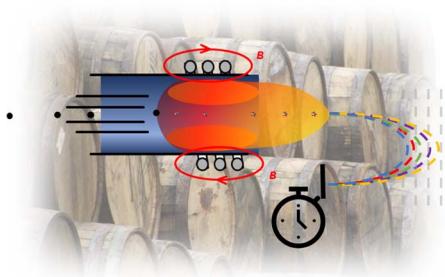
2648



**Exploratory studies on total reflection X-ray fluorescence spectrometry combined with slurry sampling for the multi-element analysis of copper-nickel sulfide ore**

Yongsheng Zhang, Yaxiong He, Hui Chen, Shuolei Wei, Guanqing Mo, Tao Xu\* and Jian Yuan\*

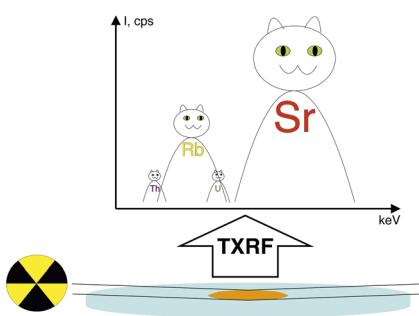
2656



**Non-target analysis and characterisation of nanoparticles in spirits via single particle ICP-TOF-MS**

Raquel Gonzalez de Vega, Thomas E. Lockwood, Lhiam Paton, Lukas Schlatt and David Clases\*

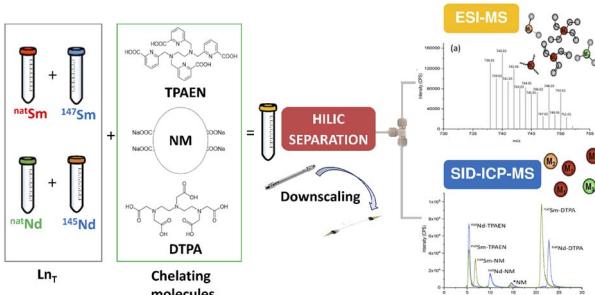
2664



**Total-reflection X-ray fluorescence determination of thorium and uranium in the presence of interfering elements in solid geological objects of natural and technogenic origin**

Timur F. Akhmetzhanov, Tatiana Y. Cherkashina,\* Alena N. Zhilicheva, Victor M. Chubarov and Galina V. Pashkova

2674



**Developing and downscaling a method by HILIC coupled simultaneously to ESIMS and ICPMS to determine the affinity of lanthanide chelating molecules using specific isotope dilution**

Marina Amaral Saraiva, Pascal E. Reiller, Cécile Marie and Carole Bresson\*



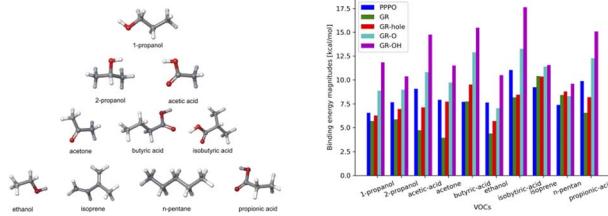
## PAPERS

2691

**Multiscale modeling of VOC-graphene nanostructure interactions: designing new sorbents for portable mass spectrometric applications**

Stevan Armaković,\* Milena Aleksić, Stamatios Giannoukos and Boris Brkić\*

Binding between VOC molecules and graphene derivatives



2703

**Experimental determination of total M shell and subshell X-ray production cross sections for uranium by proton impact**

Mariano Bonifacio, Sergio Gabriel Suárez, Tabatha Pamela Rodríguez Cabello, Andrés Sepúlveda Peñaloza, Jorge Carlos Trincavelli and Pablo Daniel Pérez\*

