

IN THIS ISSUE

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Cover

See Fang Huang *et al.*, pp. 1750–1758. Image reproduced by permission of Fang Huang from *J. Anal. At. Spectrom.*, 2024, **39**, 1750.



Inside cover

See Teruhiko Kashiwabara *et al.*, pp. 1759–1777. Image reproduced by permission of Teruhiko Kashiwabara from *J. Anal. At. Spectrom.*, 2024, **39**, 1759.

ATOMIC SPECTROMETRY UPDATES

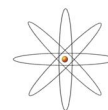
1629

Atomic spectrometry update: review of advances in elemental speciation

Robert Clough,* Chris F. Harrington, Steve J. Hill, Yolanda Madrid and Julian F. Tyson



Atomic
Spectrometry
Updates

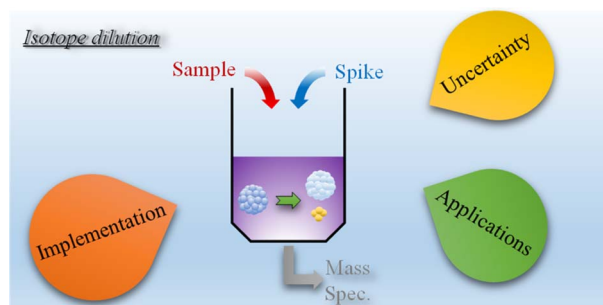


CRITICAL REVIEW

1665

An isotope dilution mass spectrometry overview: tips and applications for the measurement of radionuclides

Alexandre Quemet, Amélie Hubert, Alkiviadis Gourgiotis, Ana María Sánchez Hernández, Marielle Crozet, Guillaume Bailly, Andrew Dobney, Georges Duhamel, Joe Hiess, Urska Repinc, Sébastien Mialle, Béatrice Boulet, Raphaëlle Escoube, Céline Bouvier-Capely, Fabien Pointurier and Sébastien Picart



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**Fundamental questions
Elemental answers**

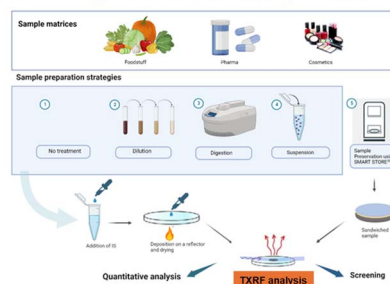
TUTORIAL REVIEW

1700

An overview of the applications of total reflection X-ray fluorescence spectrometry in food, cosmetics, and pharmaceutical research

Eva Marguí,^{*} Diane Eichert, Jasna Jablan, Fabjola Bilo, Laura E. Depero, Ana Pejović-Milić, Armin Gross, Haegen Stosnach, Aldona Kubala-Kukuś, Dariusz Banaś and Laura Borgese

Overview of TXRF applications in food, cosmetics, and pharmaceutical research

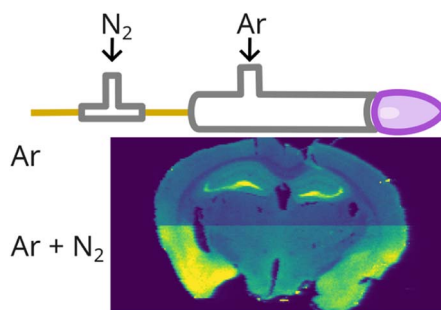


TECHNICAL NOTES

1720

Improvement in the sensitivity of LA-ICP-MS bioimaging by addition of nitrogen to the argon carrier gas

Monique G. Mello, Thomas E. Lockwood, Jonathan Wanagat, Mika T. Westerhausen and David P. Bishop^{*}

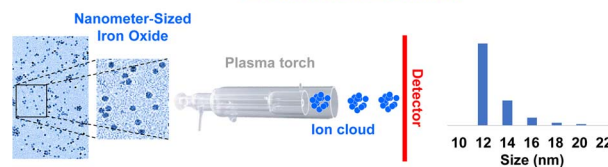


1726

Development of a methodology for analyzing nanometer-sized iron oxide by the single particle ICP-MS technique

Marie Boutry, Jules Mistral, Paula Oliveira, Nadia Baskali-Bouregaa, Frédérique Bessueille-Barbier, Nicole Gilon, Catherine Ladavière and Linda Ayouni-Derouiche^{*}

Optimization of instrumental conditions, and mathematical treatment

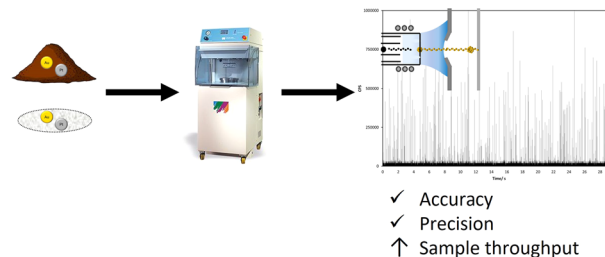


Single Particle ICP-MS

1736

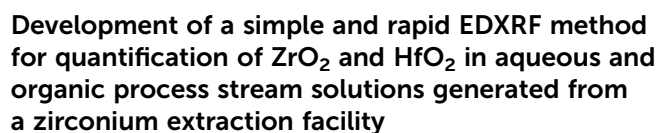
Standardization of microwave-assisted extraction procedures for characterizing non-labile metallic nanoparticles in environmental solid samples by means of single particle ICP-MS

Carlos Gómez-Pertusa,^{*} M. Carmen García-Poyo, Guillermo Grindlay, Ricardo Pedraza, M. Adela Yañez and Luis Gras



✓ Accuracy
✓ Precision
↑ Sample throughput





Y. Balaji Rao,* S. NVMS Gupta, P. V. Nagendra Kumar
and Dinesh Srivastava

1750



Yuan Fang, Qiu-Yu Wen, Zi-Cong Xiao, Hui-Min Yu
and Fang Huang*

The diagram illustrates the separation of MoW DS from a sample solution using anion exchange resin. The process involves two columns. The first column separates the matrix from the MoW DS. The second column further separates the MoW DS into Mo and W. The chromatograms show the relative abundance (%) of various elements (Ti, Fe, Zr, Nb, Ba, Ta, W, Mo) across different regions (I, II, III, IV, V) for the first and second columns.

(a) First column

Element	Region I	Region II	Region III	Region IV	Region V
Ti	High	Low	Low	Low	Low
Fe	High	High	High	High	High
Zr	High	High	High	High	High
Nb	High	High	High	High	High
Ba	High	High	High	High	High
Ta	High	High	High	High	High
W	High	High	High	High	High
Mo	High	High	High	High	High

(b) Second column

Element	Region I	Region II	Region III	Region IV	Region V
Ti	High	Low	Low	Low	Low
Fe	High	High	High	High	High
Zr	High	High	High	High	High
Nb	High	High	High	High	High
Ba	High	High	High	High	High
Ta	High	High	High	High	High
W	High	High	High	High	High
Mo	High	High	High	High	High

High-precision stable isotope measurements of tungsten and molybdenum in single sample aliquots combined with optimized separation for mixed double spikes

Teruhiko Kashiwabara,* Yusuke Fukami, Sayuri Kubo,
Ayako Watakabe, Minako Kurisu, Satoshi Tokeshi,
Tsuyoshi Iizuka and Katsuhiko Suzuki

The diagram illustrates the ID-PLS calibration method. It starts with an experimental setup where a Nd:YAG Laser is used to illuminate a sample on a 2D platform. The light path is shaped and then enters a spectrometer. The resulting spectral data is processed to obtain intensity ratios, which are then compared with an internal standard method. This process leads to the calculation of the intensity ratio drift, which is used in the PLS model for calibration. The final results are shown in two scatter plots, (a) and (b), comparing predicted and reference concentrations for two different test sets. Plot (a) shows a strong linear correlation with $R^2 = 0.9804$ and $RMSE = 0.39\%$ for Test set 1, and $R^2 = 0.9112$ and $RMSE = 0.487\%$ for Test set 2. Plot (b) shows a similar correlation with $R^2 = 0.9881$ and $RMSE = 0.457\%$ for Test set 1, and $R^2 = 0.9088$ and $RMSE = 0.487\%$ for Test set 2.

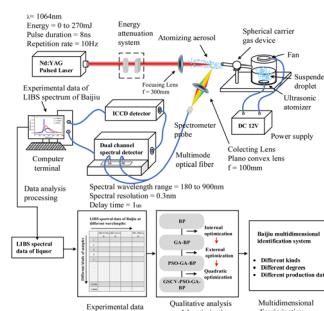
Combination of the internal standard and dominant factor PLS for improving long-term stability of LIBS measurements

Yang Zhou, Lanxiang Sun,* Yang Li, Yong Xin, Wei Dong
and Jinchi Wang

1789

High precision and fast classification of different dimensions of Baijiu using an OptGSCV quadratic optimization network combined with AS-LIBS

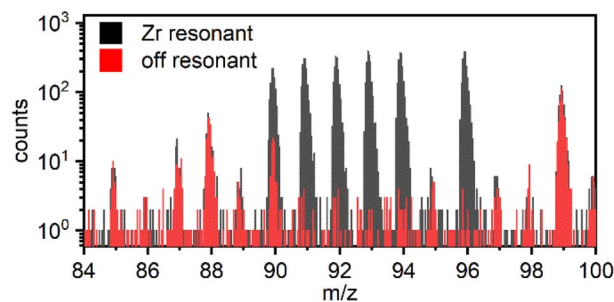
Haoyu Jin, Xiaojian Hao,* Nan Li, Ying Han, Biming Mo and Shuyi Zhang



1803

Zirconium analysis in microscopic spent nuclear fuel samples by resonance ionization mass spectrometry

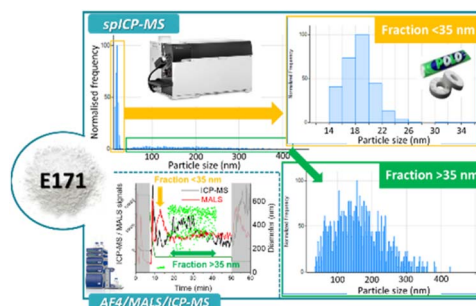
Manuel Raiwa,* Michael Savina, Danielle Ziva Shulaker, Autumn Roberts and Brett Isselhardt



1813

The potential of a multi-method platform centred on ICP-MS to provide new insights into the size-resolved quantification of TiO₂ particles in food

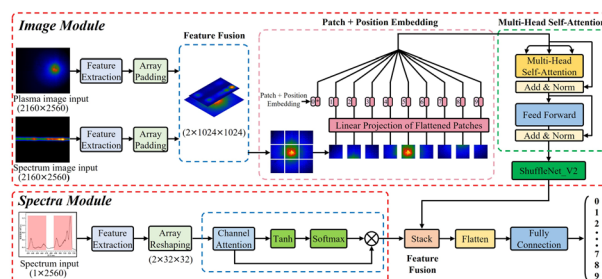
David Ojeda, Dorota Bartczak, Malvinder Singh, Paul Hancock and Heidi Goenaga-Infante*



1824

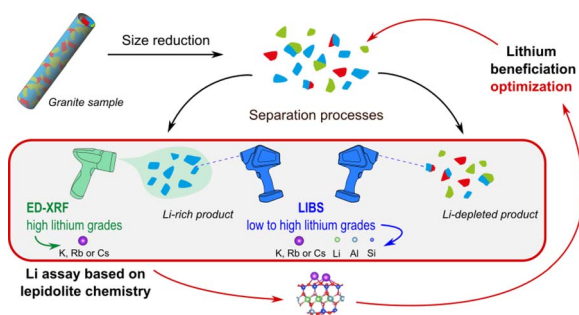
Air pressure prediction model based on the fusion of laser-induced plasma images and spectra

W. Ke, H. C. Luo, S. M. Lv, H. Yuan,* X. H. Wang, A. J. Yang, J. F. Chu, D. X. Liu and M. Z. Rong



PAPERS

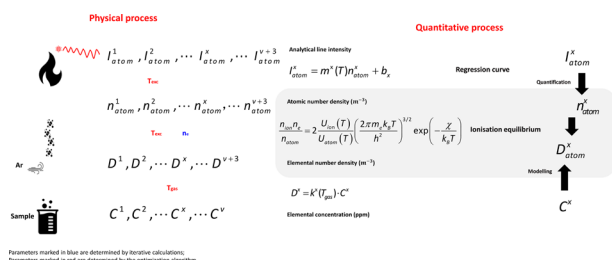
1838



Quantification of lithium using handheld instruments: application of LIBS and XRF spectroscopy to assay the lithium content of mineral processing products

C. Korbel,* N. Mezoued, B. Demeusy, C. Fabre,* J. Cauzid, I. V. Filippova and L. O. Filippov

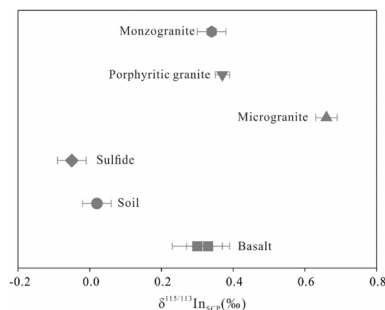
1854



The Saha ionisation equilibrium shift correction model applied to MPT-OES for analysing complex matrix samples: an example for brine samples

Haoze Wei, Zongjun Zhu, Rongyao Wang, Dengjie Yu, Wei Jin* and Bingwen Yu*

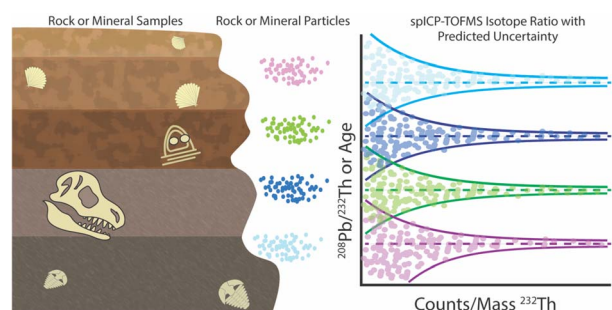
1867



Determination of indium isotopic ratios of geostandards with different matrices by multi-collector inductively coupled plasma mass spectrometry (MC-ICP-MS)

Chuanwei Zhu, Yunzhu Wu, Zerui Liu, Meifu Zhou, Guangshu Yang, Yuxu Zhang and Hanjie Wen*

1874



Isotopic ratio analysis of individual sub-micron particles via spICP-TOFMS

Sarah E. Szakas and Alexander Gundlach-Graham*

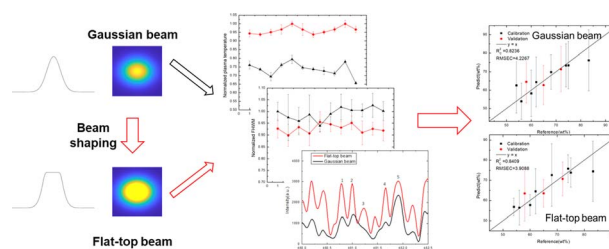


PAPERS

1885

Quantitative performance improvement using beam shaping plasma modulation for uranium detection in di-uranate using laser-induced breakdown spectroscopy

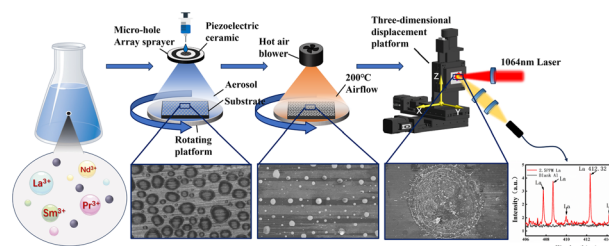
Jianxun Ji, Zongyu Hou, Weiran Song, Xiang Yu and Zhe Wang*



1895

Preparing microparticles on an elementary substrate using a micro-hole array sprayer to assist LIBS: a highly sensitive trace rare earth element detection method for aqueous solution analysis

Kezeng Pan, Jiamin Li, Shilei Zhong,* Changhong Zhang, Yiping Wang, Yuanyuan Xue and Gongyi Xue

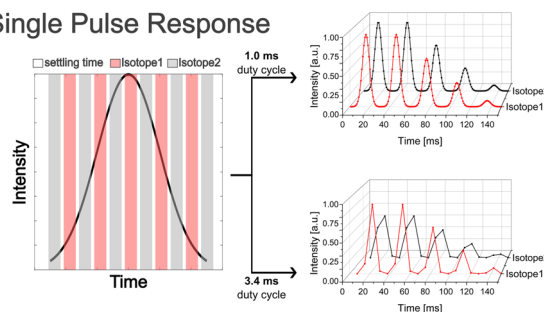


1903

Quantitative depth profile analysis using short single pulse responses in LA-ICP-Q-MS experiments

Maximilian Podsednik, Florian Fahrnberger, David Ken Gibbs, Birgit Achleitner, Silvia Larisegger, Michael Nelhiebel, Herbert Hutter and Andreas Limbeck*

Single Pulse Response

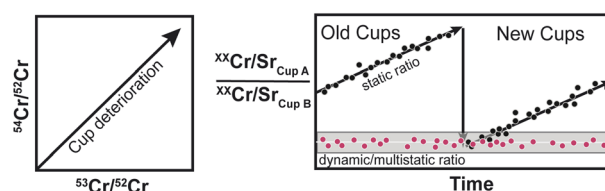


1910

Effects of Faraday cup deterioration on Sr and Cr isotope analyses by thermal ionization mass spectrometry

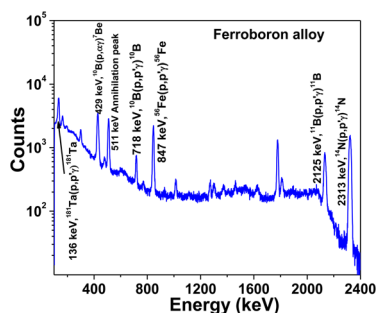
Jonas M. Schneider* and Thorsten Kleine

Effects of cup deterioration by TIMS



PAPERS

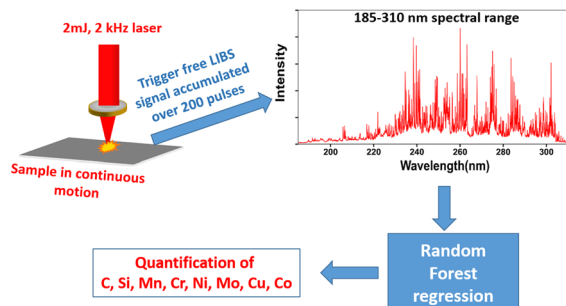
1919



Characterization of ferroboron alloys by simultaneously quantifying Fe and B mass fractions and isotopic compositions of B by external particle induced gamma-ray emission method

Sk Wasim Raja,* R. Acharya, Akash Dileep Gandhi and J. B. Singh

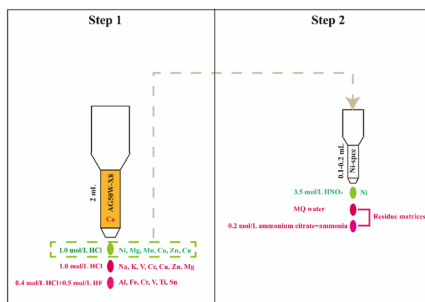
1927



Trigger-free LIBS using kHz and a few mJ laser in combination with random forest regression for the quantitative analysis of steel elements

S. Ahlawat,* A. Singh, S. Sahu, P. K. Mukhopadhyay, R. Arya and S. K. Dixit

1938



A two-step chromatographic purification method for Ni for its isotopic analysis by MC-ICP-MS

Lingke Li, Fei Wu,* Yongsheng Liu, Tao He, Jie Lin, Wen Zhang, Rui Li, Haihong Chen, Keqing Zong, Zhen Zeng and Zhaochu Hu

CORRECTION

1948

Correction: Development of a multi-isotopic (Pb, Fe, Cu) analytical protocol in gold matrices for ancient coin provenance studies

Louise de Palaminy,* Franck Poitrasson, Sandrine Baron, Maryse Blet-Lemarquand and Loïc Perrière

