

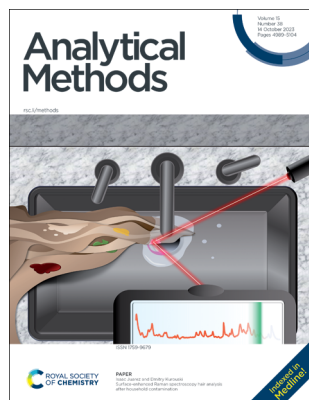
# Analytical Methods

rsc.li/methods

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

## IN THIS ISSUE

ISSN 1759-9679 CODEN AMNECT 15(38) 4989–5104 (2023)



### Cover

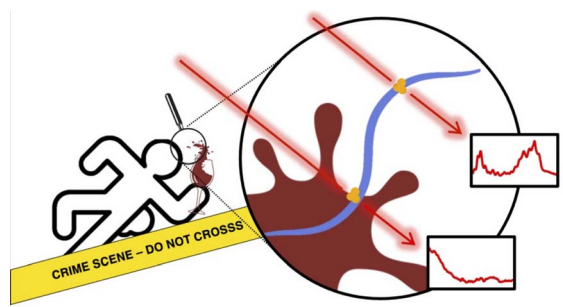
See Isaac Juarez and Dmitry Kurouski, pp. 4996–5001.  
Image reproduced by permission of Aidan P. Holman, *Anal. Methods*, 2023, 15, 4996.

## PAPERS

4996

### Surface-enhanced Raman spectroscopy hair analysis after household contamination

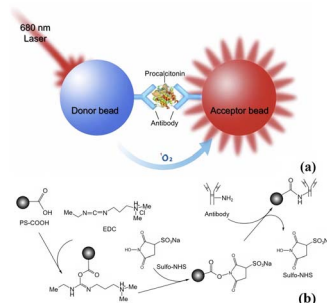
Isaac Juarez and Dmitry Kurouski\*



5002

### Preparation and characterization of a homogeneous immunoassay for point-of-care testing (POCT) of prolactin (PCT)

Zhaoying Li, Weixiang Zhai, Lu Wang, Jiyang Liu, Chunjie Li\* and Liang Xu\*



## 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 [methods@rsc.org](mailto:methods@rsc.org)

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

Analytical Methods (electronic: ISSN 1759-9679) is published 48 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: £2416; US\$4255. 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)

# Analytical Methods

[rsc.li/methods](http://rsc.li/methods)

Early applications of new analytical methods with clear societal impact.

## Editorial Board

### Editor-in-Chief

Scott Martin, St. Louis University, USA

### Associate Editors

Jonas Bergquist, Uppsala University, Sweden  
Wendell Coltro, Federal University of Goiás, Brazil

Juan García-Reyes, Jaén University, Spain  
Tony Killard, University of the West of England, UK

Zhen Liu, Nanjing University, China  
Matthew Lockett, University of North Carolina at Chapel Hill, USA

Chao Lu, Beijing University of Chemical Technology, China

Fiona Regan, Dublin City University, Ireland  
Michael Roper, Florida State University, USA  
Jill Venton, University of Virginia, USA

## Advisory Board

Jailson de Andrade, Federal University of Bahia, Brazil

Lane Baker, Indiana University, USA

Craig Banks, The Manchester Metropolitan University, UK

Emanuel Carrilho, University of São Paulo, Brazil

James Chapman, The University of Queensland, Australia

Yi Chen, Chinese Academy of Sciences, China

Christopher Easley, Auburn University, USA  
Anthony Gachanja, Jomo Kenyatta University of Agriculture and Technology, Kenya

Amanda Hummon, Ohio State University, USA

Lauro Kubota, Instituto de Química, Brazil

Ally Lewis, University of York, UK  
Juewen Liu, University of Waterloo, Canada

Susan Lunte, University of Kansas, USA  
Jim Luong, Dow Chemical Canada ULC, Canada

Susheel Mittal, Thapar University, India  
Antonio Molina-Díaz, University of Jaén, Spain

Koji Otsuka, Kyoto University, Japan  
Brett Paull, University of Tasmania, Australia

Zachary Schultz, Ohio State University, USA  
Guobao Xu, Changchun Institute of Applied Chemistry, China

## Information for Authors

Full details on how to submit material for publication in Analytical Methods 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/methods](http://rsc.li/methods)

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

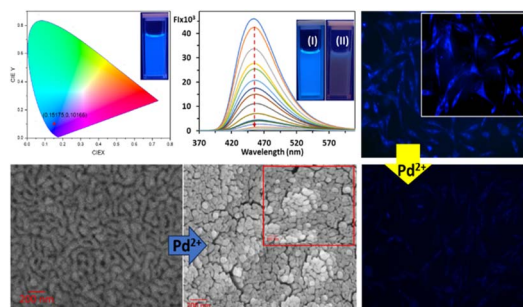


## PAPERS

5010

# A 1,8-naphthalimide based chemosensor for intracellular and biofluid detection of Pd<sup>2+</sup> ions: microscopic and anticounterfeiting studies

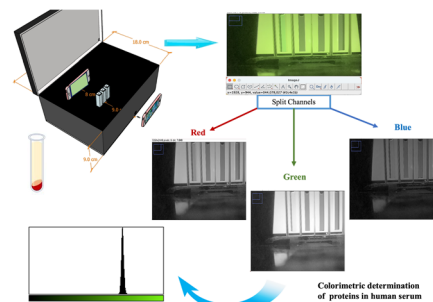
Sanjeev Kumar, Neha Sharma, Satwinder Singh Marok, Satwinderjeet Kaur and Prabhpreet Singh\*



5018

# Smartphone digital image colorimetry for quantification of serum proteins

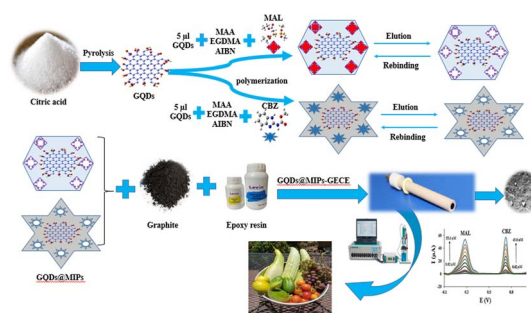
Victor Markus,\* Ozlem Dalmizrak, Oğuz Han Edebal, Mais Al-Nidawi and Jude Caleb\*



5027

# Dual-template imprinted polymer electrochemical sensor for simultaneous determination of malathion and carbendazim using graphene quantum dots

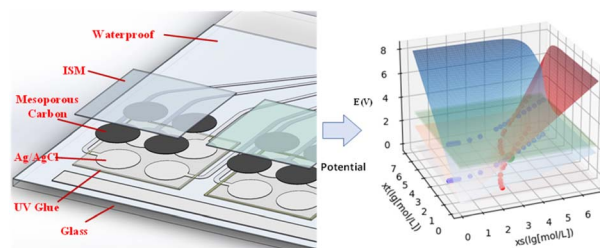
Fariba Beigmoradi, Masoud Rohani Moghadam,\* Zahra Garkani-Nejad, Alireza Bazmandegan-Shamili and Hamid Reza Masoodi



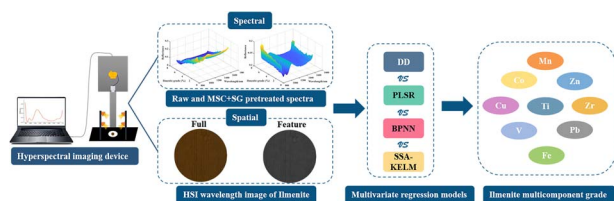
5038

# A multi-ion interference decoupling model based on ion-selective electrode arrays

Zhancheng Mai, Shaoqiu Xiao, Wei Zhang and Kai Wang\*



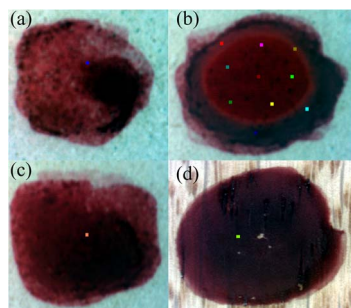
5050



### Multicomponent hyperspectral grade evaluation of ilmenite using spectral-spatial joint features

Xinqiang Yi, Manjiao Chen,\* Wang Guo, Xinjun Hu,\*  
Jiahong Zhang, Xue Fei, Lipeng Han and Jianping Tian

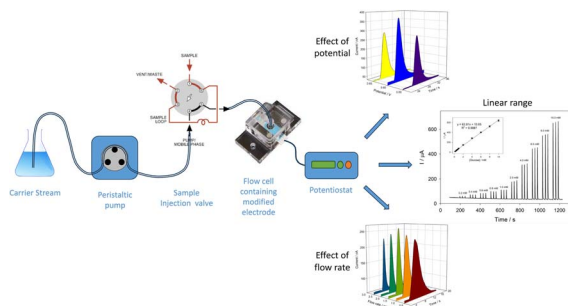
5063



### Age estimation of bloodstains based on convolutional neural network algorithm and hyperspectral imaging technology

Yang Qifu, Zhang Xinyu, Qi Yueying, Xie Jiayi,  
Zhang Jianqiang, Liang Ying, Wu Jiaquan and Ma Kun\*

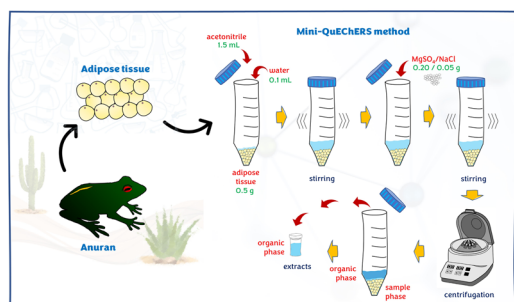
5071



### Non-enzymatic glucose sensing using a nickel hydroxide/chitosan modified screen-printed electrode incorporated into a flow injection analysis system

Wesley J. McCormick,\* Eva McLoughlin  
and Denis McCrudden

5078



### Development and application of a mini-QuEChERS method for the determination of pesticide residues in anuran adipose tissues

Allyson Leandro Rodrigues dos Santos, Igor de Melo Lima,  
Andressa Tironi Vieira, Patricia de Menezes Gondim,  
Paulo Cascon and Anizio Marcio de Faria\*

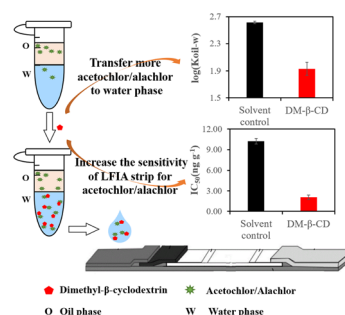


## PAPERS

5087

# A lateral flow immunoassay method for the rapid detection of acetochlor and alachlor in vegetable oil by sensitivity enhancement by using dimethyl- $\beta$ -cyclodextrin

Zepeng Li, Yuxiang Wu, Zijing Li, Bingyu Yu, Xinyi Mao and Guoqing Shi\*



5095

# Simple and fast microderivatization method for determining formaldehyde using narrow-bore liquid chromatography with UV detection

Hsin-Shu Ho and Chi-Yu Lu\*

