

The Analyst

Interdisciplinary detection science

www.rsc.org/analyst

RSC Publishing is a not-for-profit publisher and a division of the Royal Society of Chemistry. Any surplus made is used to support charitable activities aimed at advancing the chemical sciences. Full details are available from www.rsc.org

IN THIS ISSUE

ISSN 0003-2654 CODEN ANALAO 133(10) 1285–1456 (2008)



Cover

See R. P. Hall, C. M. Ogilvie, E. Aarons and S. N. Jayasinghe, pp. 1347–1351.
Single-needle bio-electrosprayed blood fails to demonstrate any significant negative effects from a genetic, genomic to physiological level.

Image reproduced by permission of Suwan N. Jayasinghe from *Analyst*, 2008, **133**, 1347.

CHEMICAL TECHNOLOGY

T73

Drawing together research highlights and news from all RSC publications, *Chemical Technology* provides a 'snapshot' of the latest applications and technological aspects of research across the chemical sciences, showcasing newsworthy articles and significant scientific advances.

Chemical Technology

October 2008/Volume 5/Issue 10

www.rsc.org/chemicaltechnology

i-SECTION: HIGHLIGHTS

1297

Recent developments in ambient ionization techniques for analytical mass spectrometry

Glenn A. Harris, Leonard Nyadong and Facundo M. Fernandez*

With an ever-growing list of applications and new techniques, the development of ambient mass spectrometry shows little sign of slowing. Highlighted in this article are the recent advances in this promising field.

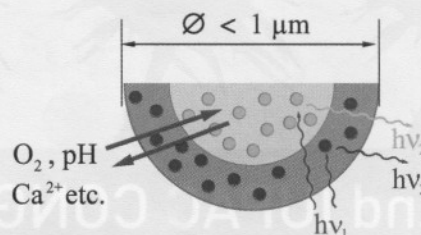


1302

Optical nanosensors—smart tools in bioanalytics

Sergey M. Borisov* and Ingo Klimant

The recent progress in the field of optical nanosensors. It gives an overview on materials, sensing schemes and applications of these smart tools in bioanalytics.



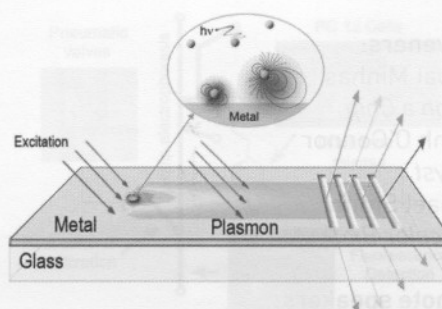
I-SECTION: CRITICAL REVIEW

1308

Plasmon-controlled fluorescence: a new paradigm in fluorescence spectroscopy

J. R. Lakowicz,* K. Ray, M. Chowdhury, H. Szmazinski, Y. Fu, J. Zhang and K. Nowaczyk

In this forward-looking overview we describe the near-field interactions of fluorophores with metallic nanostructures and how these effects can be used to enhance current measurements and to enable a new class of devices based on the manipulation of the excited-state energy of fluorophores in metallic nanostructures.



COMMUNICATIONS

1347

Genetic, genomic and physiological state studies on single-needle bio-electrosprayed human cells

Richard P. Hall, Caroline M. Ogilvie, Emma Aarons and Suwan N. Jayasinghe*

This communication demonstrates no increased chromosome breakage or significant effects on cell nuclei following single-needle bio-electrospraying. These findings further extend the potential applications of bio-electrosprays.

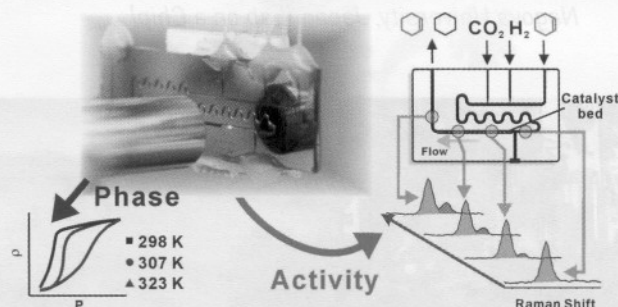


1352

On-chip Raman analysis of heterogeneous catalytic reaction in supercritical CO₂: phase behaviour monitoring and activity profiling

Atsushi Urakawa, Franz Trachsel, Philipp Rudolf von Rohr* and Alfons Baiker*

Raman spectroscopy on a chip based Si/glass microreactor allows fast and simultaneous analysis of concentration profiles and phase behaviour of a heterogeneously catalyzed reaction at high pressure.

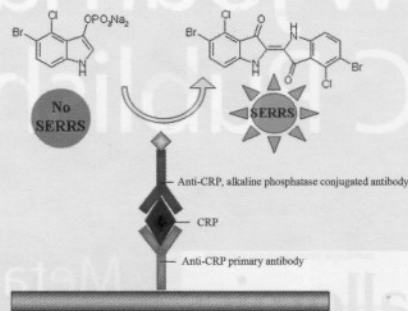


1355

SERRS immunoassay for quantitative human CRP analysis

Fiona M. Campbell, Andrew Ingram, Paul Monaghan, Jon Cooper, Naveed Sattar, P. David Eckersall* and Duncan Graham*

SERRS has been used for the first time for the measurement of C-reactive protein (CRP) in an immunoassay. CRP, a biological marker for the diagnosis of infection and inflammation, is quantified in an ELISA using conventional reagents, but the usual colorimetric detection step is replaced by SERRS detection, offering improved sensitivity and potential for multiplexing analysis.



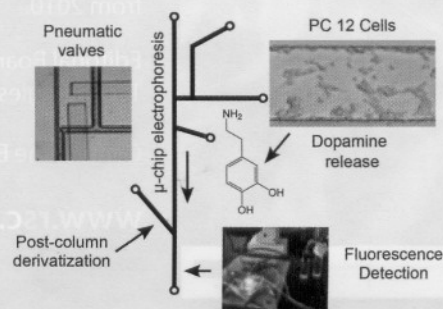
PAPERS

1358

Microchip-based integration of cell immobilization, electrophoresis, post-column derivatization, and fluorescence detection for monitoring the release of dopamine from PC 12 cells

Michelle W. Li and R. Scott Martin*

We describe the fabrication and evaluation of a multilayer microchip device that can be used to quantitatively measure the amount of catecholamines released from PC 12 cells immobilized within the same device.

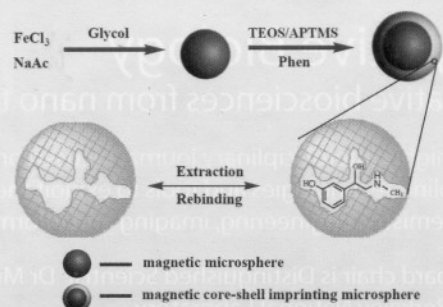


1367

Novel superparamagnetic core-shell molecular imprinting microspheres towards high selective sensing

Guiying Jin, Wei Li, Shaoning Yu, Youyuan Peng and Jilie Kong*

Schematic representation of the preparation of MCSIMs

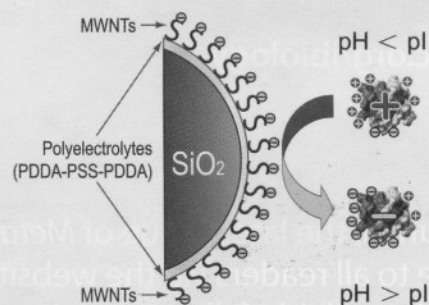


1373

Isolation and pre-concentration of basic proteins in aqueous mixture *via* solid-phase extraction with multi-walled carbon nanotubes assembled on a silica surface

Zhuo Du, Yong-Liang Yu, Xiao-Rui Yan and Jian-Hua Wang*

Separation and pre-concentration of basic proteins was achieved *via* solid-phase extraction with multi-walled carbon nanotubes (MWNTs) immobilized on a silica surface as a novel sorbent which was obtained by polyelectrolyte-assisted layer-by-layer (LBL) assembly.

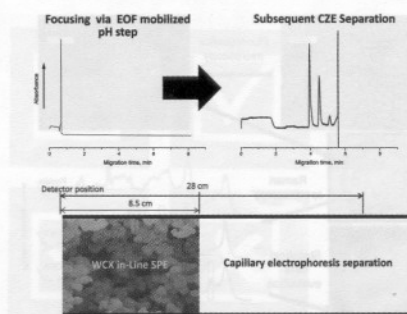


1380

Selective extraction and elution of weak bases by in-line solid-phase extraction capillary electrophoresis using a pH step gradient and a weak cation-exchange monolith

Jonathan R. E. Thabano, Michael C. Breadmore,*
Joseph P. Hutchinson, Cameron Johns and Paul R. Haddad

We have developed a strategy for the selective or universal adsorption and elution of weak bases for in-line solid-phase extraction–capillary electrophoresis using a weak cation-exchange monolith in conjunction with analyte focusing *via* an electroosmotic flow-mobilized pH gradient.



1388

Ultratrace analysis of Antarctic snow samples by reaction cell inductively coupled plasma mass spectrometry using a total-consumption micro-sample-introduction system

Marco Grotti,* Francesco Soggia and Josè Luis Todoli

A new procedure for the determination of ultratrace elements in snow samples has been developed, using quadrupole ICP-MS equipped with the dynamic reaction cell and a total-consumption micro-sample-introduction system

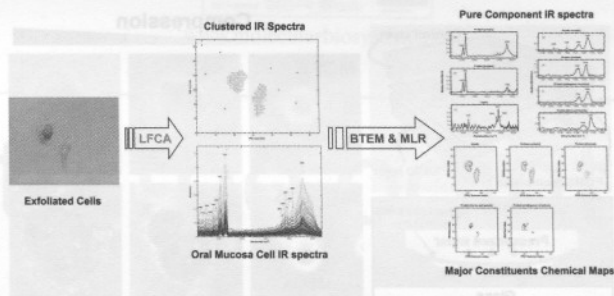


1395

Utilization of spectral vector properties in multivariate chemometrics analysis of hyperspectral infrared imaging data for cellular studies

Suat-Teng Tan, Kejia Chen, Suyun Ong and Wee Chew*

This paper demonstrates a suite of numerical techniques utilized in a concerted fashion for the efficacious multivariate chemometrics analysis of hyperspectral infrared imaging data of exfoliated oral mucosa cells.

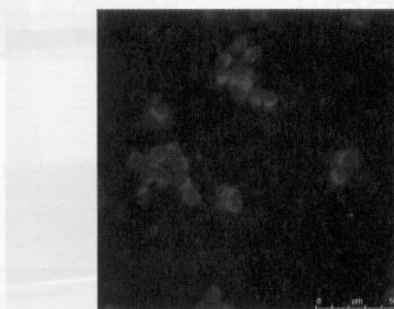


1409

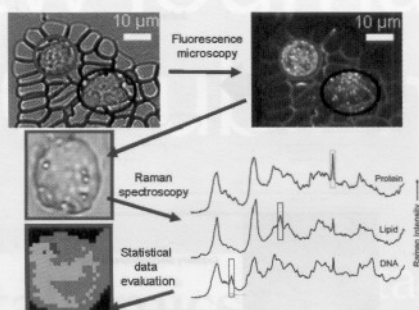
A near-infrared fluorescent probe for lipid hydroperoxides in living cells

Ping Li, Bo Tang,* Yanlong Xing, Puming Li, Guiwen Yang and Liang Zhang

A novel, near-infrared fluorescent probe TCP (tricarboxyanine diphenylphosphine) was designed, synthesized and applied to detect lipid hydroperoxides within the membranes of living cells with high sensitivity and good selectivity.



1416

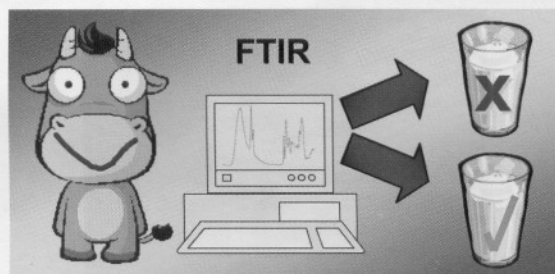


Analysis of single blood cells for CSF diagnostics *via* a combination of fluorescence staining and micro-Raman spectroscopy

Michaela Harz, Michael Kiehntopf, Stephan Stöckel, Petra Rösch, Thomas Deufel and Jürgen Popp*

Blood cell analysis in cerebrospinal fluid (CSF) is proposed, which provides the simultaneous determination of single blood cell differentiation *via* fluorescence staining and additional high specific molecular signatures *via* Raman spectroscopy.

1424

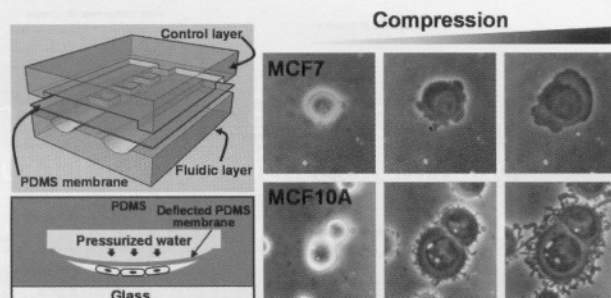


Rapid and quantitative detection of the microbial spoilage in milk using Fourier transform infrared spectroscopy and chemometrics

Nicoletta Nicolaou and Royston Goodacre*

Two infrared spectroscopy-based methods incorporating chemometrics were developed for the rapid and accurate enumeration of the microbial spoilage levels in whole, semi-skimmed and skimmed milk.

1432

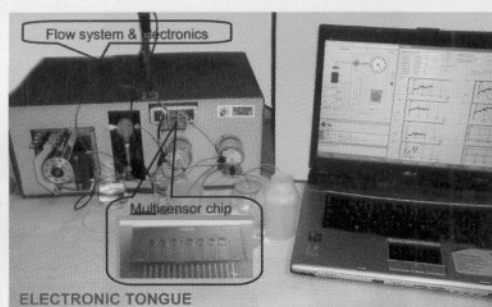


Biomechanical analysis of cancerous and normal cells based on bulge generation in a microfluidic device

Yu Chang Kim, Sang-Jin Park and Je-Kyun Park*

Here we present a new biomechanical analysis method for discrimination between cancerous and normal cells using a microfluidic device. This study is the first demonstration showing the difference of bulge generation based on cytoskeleton quantity inside the cell.

1440



Electronic integrated multisensor tongue applied to grape juice and wine analysis

Lia Moreno i Codinachs, Joachim P. Klooock, Michael J. Schöning, Antoni Baldi, Andrey Ipatov, Andrey Bratov and Cecilia Jiménez-Jorquera*

A multisensor has been applied to grape juice and wine analysis: there is potential for distinguishing the grape variety and the vintage year, and also several sample parameters.