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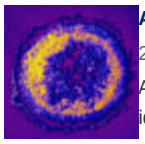

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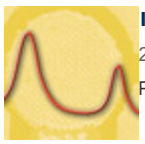

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Front cover

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Contents and Highlights in Chemical Technology

Analyst, 2009, **134**, 2171

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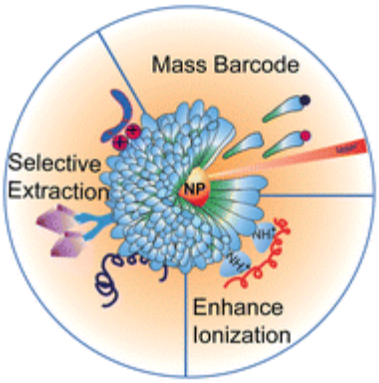
Minireview

Engineered nanoparticle surfaces for improved mass spectrometric analyses

Zheng-Jiang Zhu, Vincent M. Rotello and Richard W. Vachet, *Analyst*, 2009, **134**, 2183

DOI: 10.1039/b910428c



This Minireview highlights some of the emerging work that integrates surface-engineered nanoparticles with mass spectrometry to improve the analysis of a wide variety of chemical and biological systems.

Critical Reviews

Functional electrospray emitters

Michel Prudent and Hubert H. Girault, *Analyst*, 2009, **134**, 2189

DOI: 10.1039/b910917j

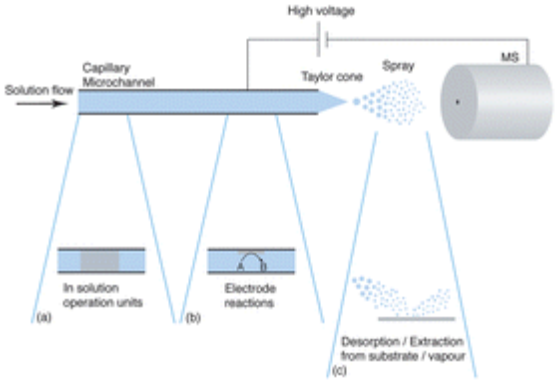
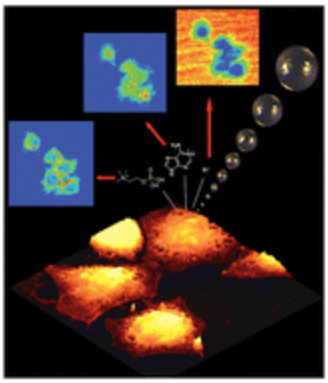


Illustration of the three levels of functionalities in electrospray ionisation sources. (a) In solution operation units, (b) electrochemical reactions at the electrode used to apply the high-voltage and (c) desorption and extraction in the spray zone.

Cellular imaging with secondary ion mass spectrometry

John S. Fletcher, *Analyst*, 2009, **134**, 2204

DOI: 10.1039/b913575h



Secondary ion mass spectrometry (SIMS) allows label-free chemical imaging with cellular

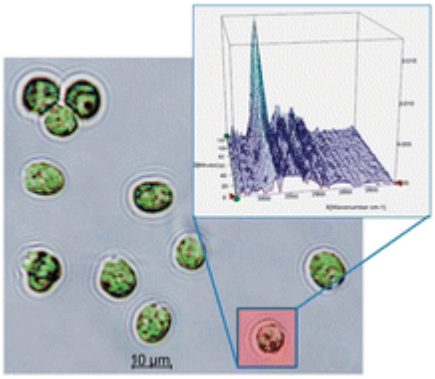
and, with increasing regularity, sub-cellular resolution. New technologies also enable 3D imaging.

Communications

Measurement of metabolite formation in single living cells of *Chlamydomonas reinhardtii* using synchrotron Fourier-Transform Infrared spectromicroscopy

Kira L. Goff, Luca Quaroni and Kenneth E. Wilson, *Analyst*, 2009, **134**, 2216

DOI: 10.1039/b915810c

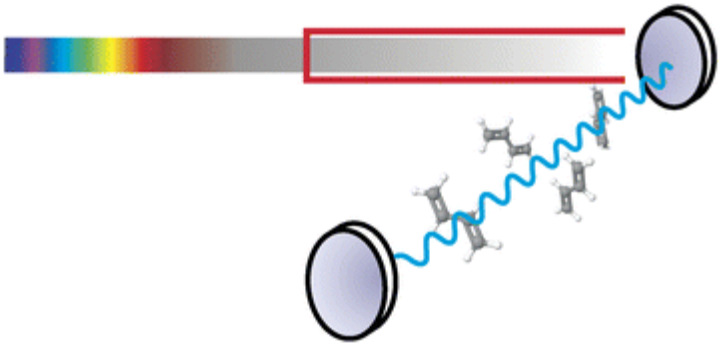


We demonstrate the capability of synchrotron-based Fourier-Transform Infrared spectromicroscopy to perform kinetic measurements of ethanol formation in the anaerobic metabolism of single, living cells of the unicellular algae *Chlamydomonas reinhardtii*.

Near-infrared broad-band cavity enhanced absorption spectroscopy using a superluminescent light emitting diode

W. Denzer, M. L. Hamilton, G. Hancock, M. Islam, C. E. Langley, R. Peverall and G. A. D. Ritchie, *Analyst*, 2009, **134**, 2220

DOI: 10.1039/b916807a



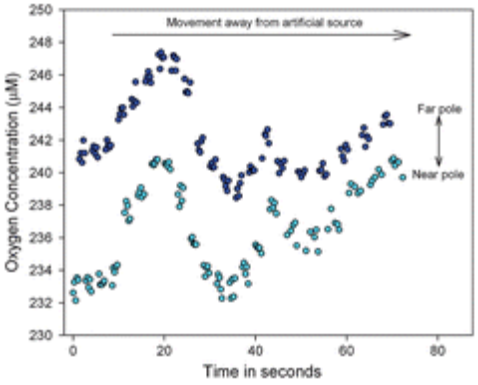
Cavity enhanced spectroscopy is demonstrated in the near-infrared using a high brightness fibre coupled superluminescent light emitting diode and where broad spectral features of several potential target molecules exist.

Papers

Self-referencing optrode technology for non-invasive real-time measurement of biophysical flux and physiological sensing

M. R. Chatni and D. M. Porterfield, *Analyst*, 2009, **134**, 2224

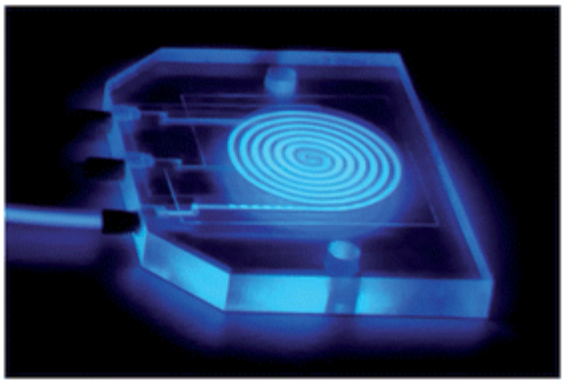
DOI: 10.1039/b903092a



In self-referencing modality, the optrode is oscillated (0.1 Hz) between two points a few microns apart in a concentration gradient, converting the optrodic oxygen concentration sensor into a dynamic flux sensor, based on Fick's law. Because of the inherent noise and drift filtering associated with phase-sensitive detection it is now possible to measure pico-molar flux levels.

Precision milled flow-cells for chemiluminescence detection

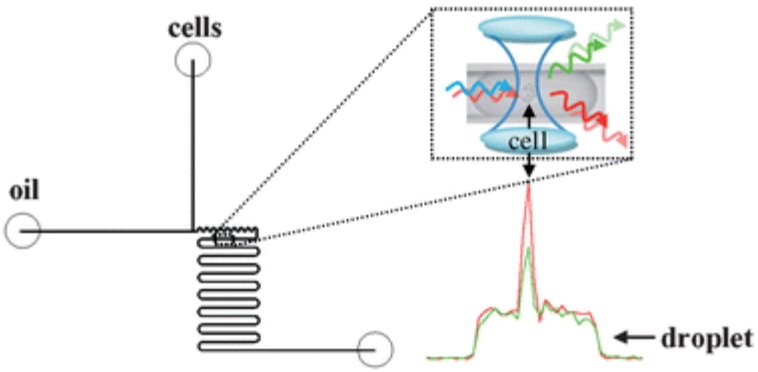
Stephan Mohr, Jessica M. Terry, Jacqui L. Adcock, Peter R. Fielden, Nick J. Goddard, Neil W. Barnett, Duane K. Wolcott and Paul S. Francis, *Analyst*, 2009, **134**, 2233
DOI: 10.1039/b914595h



Chemiluminescence flow-cells were constructed by machining into polymer chips and sealing the channels with transparent films. Greater intensities were obtained using opaque white chips, which minimised the loss of light.

Identification of rare progenitor cells from human periosteal tissue using droplet microfluidics

Monpichar Srisa-Art, Ian C. Bonzani, Andrew Williams, Molly M. Stevens, Andrew J. deMello and Joshua B. Edel, *Analyst*, 2009, **134**, 2239
DOI: 10.1039/b910472k

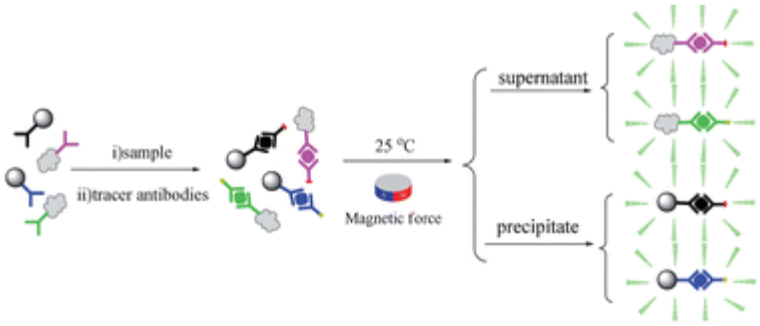


Droplet-based microfluidics was used as a platform technology for the identification and quantification of distinct cell phenotypes; this provides a necessary first step towards the development of a novel microfluidic cell sorting technology.

Homogeneous temperature- and substrate-resolved technology for a chemiluminescence multianalyte immunoassay

Hongyan Kang, Juru Miao, Zhijuan Cao and Jianzhong Lu, *Analyst*, 2009, **134**, 2246

DOI: 10.1039/b910689h

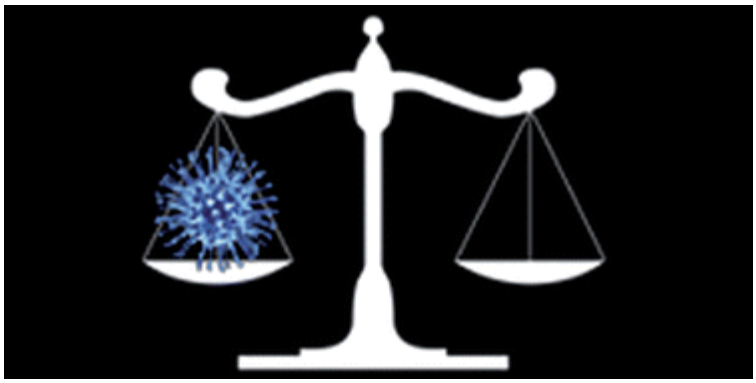


Herein we report on the development of a novel dual-resolution chemiluminescence (CL) immunoassay platform for the homogeneous determination of four proteins as exemplified by three immunoglobulins and one protein drug, based on temperature- and substrate-resolved technologies.

Signature peptides of influenza nucleoprotein for the typing and subtyping of the virus by high resolution mass spectrometry

Alexander B. Schwahn, Jason W. H. Wong and Kevin M. Downard, *Analyst*, 2009, **134**, 2253

DOI: 10.1039/b912234f

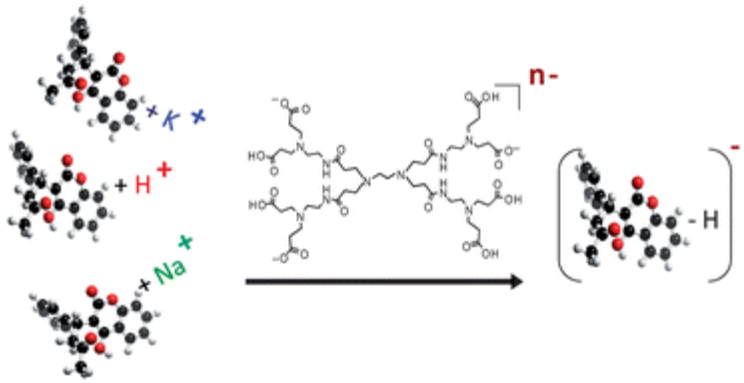


Conserved signature peptides of the nucleoprotein antigen of influenza are identified and detected by high resolution mass spectrometry that enable the virus to be typed and subtyped.

Conversion of multiple analyte cation types to a single analyte anion type *via* ion/ion charge inversion

Kerry M. Hassell, Yves LeBlanc and Scott A. McLuckey, *Analyst*, 2009, **134**, 2262

DOI: 10.1039/b914304a

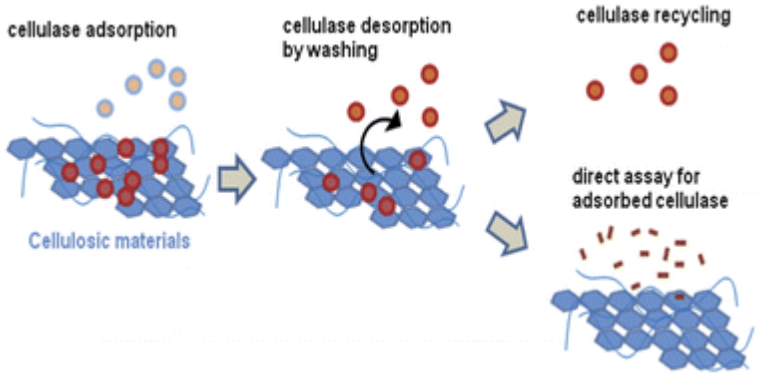


Analyte molecules ionized with different cationizing agents can all be converted to a single analyte anion type for subsequent mass spectrometry *via* charge inversion ion/ion reactions.

Direct quantitative determination of adsorbed cellulase on lignocellulosic biomass with its application to study cellulase desorption for potential recycling

Zhiguang Zhu, Noppadon Sathitsuksanoh and Y.-H. Percival Zhang, *Analyst*, 2009, **134**, 2267

DOI: 10.1039/b906065k

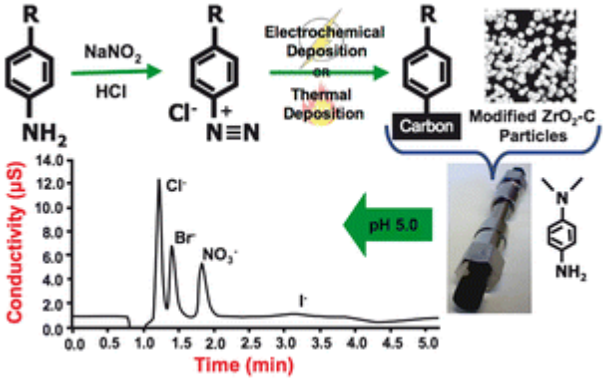


A simple and low-cost method for determining the adsorbed cellulase on cellulosic materials or pretreated lignocellulose was developed.

Covalently modified graphitic carbon-based stationary phases for anion chromatography

Stuart D. Chambers, Mark T. McDermott and Charles A. Lucy, *Analyst*, 2009, **134**, 2273

DOI: 10.1039/b911988d

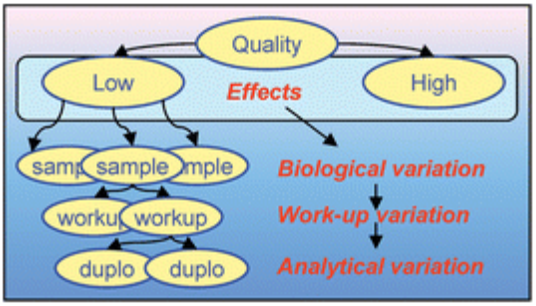


The covalent modification of carbon-clad zirconia particles using *in situ* diazonium generation and thermal deposition to form new ion-exchange media is described. The new anion-exchanging phases are then used in the separations of small inorganic ions.

Characterizing the precision of mass-spectrometry-based metabolic profiling platforms

Age K. Smilde, Mariët J. van der Werf, Jean-Pierre Schaller and Cor Kistemaker, *Analyst*, 2009, **134**, 2281

DOI: 10.1039/b902242b

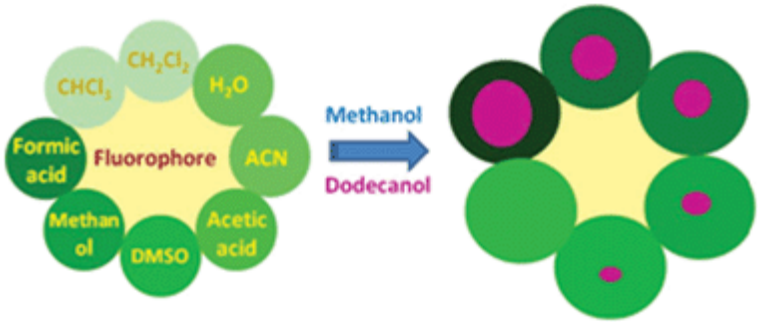


Figures of merit are important in analytical chemistry. Reporting comprehensive precision values in metabolomics is not trivial. A proper experimental design with analysis of variance techniques can provide such values.

The environmental effect on the fluorescence intensity in solution. An analytical model

Javier Galbán, Elena Mateos, Vicente Cebolla, Andrés Domínguez, Arancha Delgado-Camón, Susana de Marcos, Isabel Sanz-Vicente and Vanesa Sanz, *Analyst*, 2009, **134**, 2286

DOI: 10.1039/b912063g

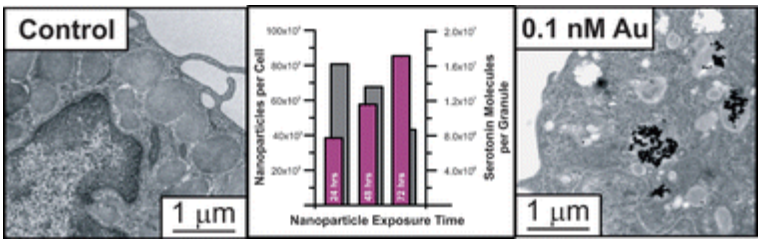


A mathematical model describing the non-specific interactions of the medium surrounding a fluorophore on its fluorescence intensity is proposed. The very first experimental data are shown demonstrating the fulfilment of this model.

Amperometric assessment of functional changes in nanoparticle-exposed immune cells: varying Au nanoparticle exposure time and concentration

Bryce J. Marquis, Melissa A. Maurer-Jones, Katherine L. Braun and Christy L. Haynes, *Analyst*, 2009, **134**, 2293

DOI: 10.1039/b913967b

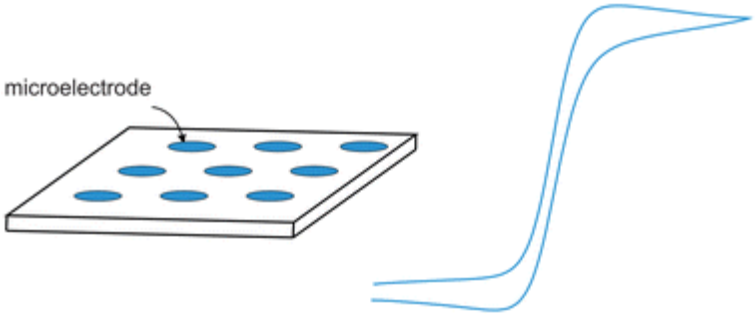


Carbon-fiber microelectrode amperometry is used to investigate the time evolution of gold nanoparticle effects on the release of serotonin from cultured mouse peritoneal mast cells.

Why 'the bigger the better' is not always the case when utilising microelectrode arrays: high density *vs.* low density arrays for the electroanalytical sensing of chromium(VI)

Sebastian J. Hood, Dimitrios. K. Kampouris, Rashid O. Kadara, Norman Jenkinson, F. Javier del Campo, Francesc Xavier Muñoz and Craig E. Banks, *Analyst*, 2009, **134**, 2301

DOI: 10.1039/b911507b

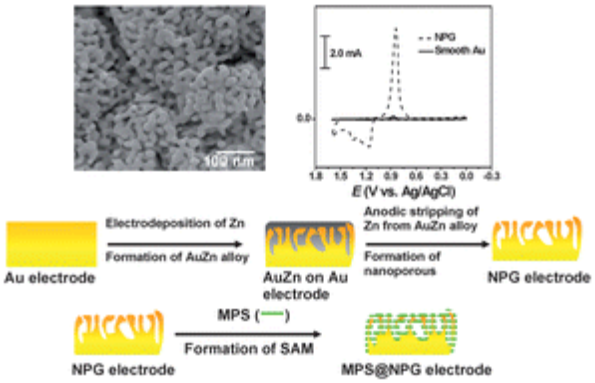


High density and low density microelectrode arrays are explored towards the sensing of Cr (VI) where it is shown that a higher density array does not always imply improved electroanalytical performance and consideration to diffusion zones needs to be considered.

Application of a nanoporous gold electrode for the sensitive detection of copper *via* mercury-free anodic stripping voltammetry

Jing-Fang Huang and Bo-Tsuen Lin, *Analyst*, 2009, **134**, 2306

DOI: 10.1039/b910282e

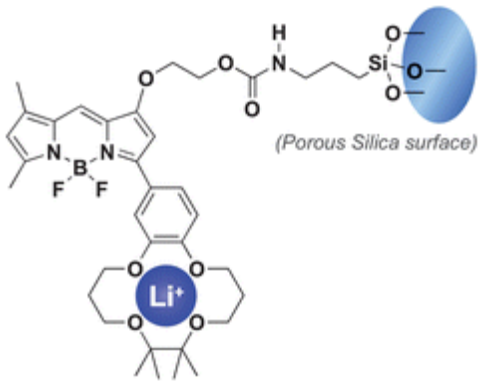


This paper describes how a new mercury-free alternative electrode material, nanoporous gold (NPG), was applied to improve the performance of detecting trace metals in stripping voltammetry.

A highly Li^+-selective glass optode based on fluorescence ratiometry

Yosuke Ando, Yuki Hiruta, Daniel Citterio and Koji Suzuki, *Analyst*, 2009, **134**, 2314

DOI: 10.1039/b912756a

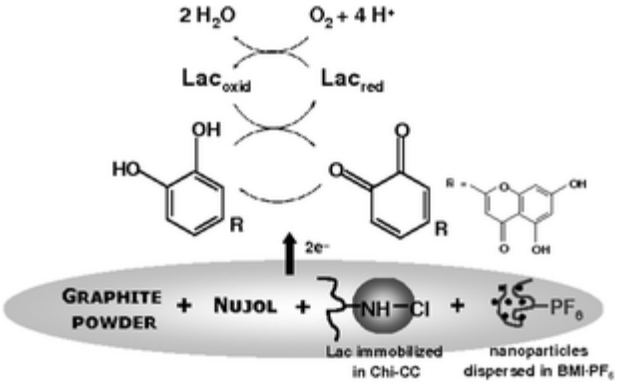


A newly developed Li^+-selective glass optode demonstrates dual fluorescence emission response allowing ratiometric signal processing, independence of interfering cations and pH, good signal repeatability and stability, indicating applicability for clinical analysis.

Biosensor for luteolin based on silver or gold nanoparticles in ionic liquid and laccase immobilized in chitosan modified with cyanuric chloride

Ana Cristina Franzoi, Iolanda Cruz Vieira, Jairton Dupont, Carla Weber Scheeren and Luciane França de Oliveira, *Analyst*, 2009, **134**, 2320

DOI: 10.1039/b911952c

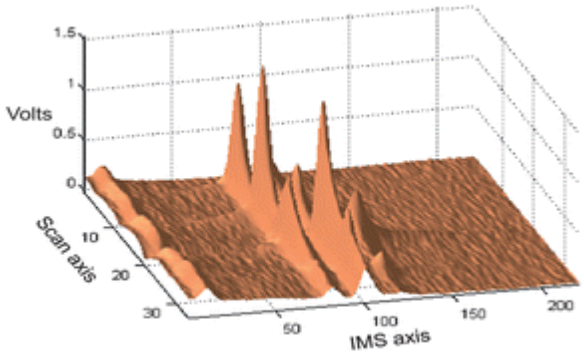


We report the construction of novel biosensors based on Ag or Au nanoparticles dispersed in ionic liquid (IL) BMI·PF_6 and laccase (Lac) immobilized in chitosan (Chi) modified with cyanuric chloride (CC) for the luteolin determination using square-wave voltammetry.

Improved quantitative analysis of ion mobility spectrometry by chemometric multivariate calibration

Carlos G. Fraga, Dayle R. Kerr and David A. Atkinson, *Analyst*, 2009, **134**, 2329

DOI: 10.1039/b912638d



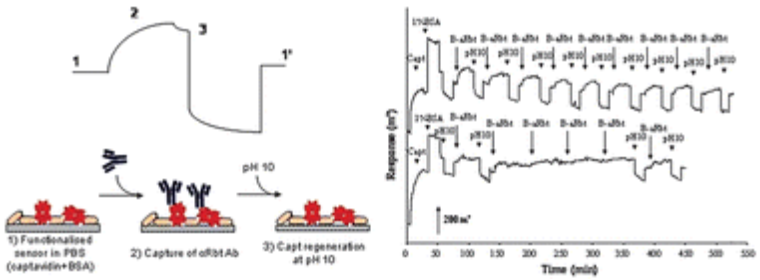
TSD-IMS data of a representative Composition B sample

Traditional peak-area calibration and the multivariate calibration methods of principal component regression (PCR) and partial least squares (PLS), including unfolded PLS (U-PLS) and multi-way PLS (N-PLS), were evaluated for the quantification of 2,4,6-trinitrotoluene (TNT) and cyclo-1,3,5-trimethylene-2,4,6-trinitramine (RDX) in Composition B samples analyzed by temperature step desorption ion mobility spectrometry (TSD-IMS).

Captavidin: a new regenerable biocomponent for biosensing?

Cristina García-Aljaro, Francesc Xavier Muñoz and Eva Baldrich, *Analyst*, 2009, **134**, 2338

DOI: 10.1039/b905050g

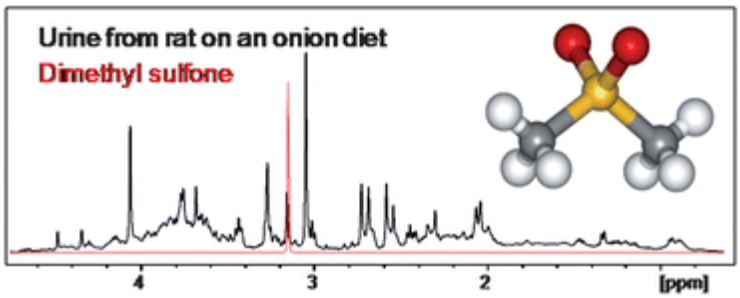


In this work captavidin, a recently described biotin-binding regenerable protein, is investigated as a new biocomponent for the development of reusable biosensors using as a model Surface Plasmon Resonance (SPR).

An exploratory NMR nutri-metabonomic investigation reveals dimethyl sulfone as a dietary biomarker for onion intake

Hanne Winning, Eduvigis Roldán-Marín, Lars O. Dragsted, Nanna Viereck, Morten Poulsen, Concepción Sánchez-Moreno, M. Pilar Cano and Søren B. Engelsen, *Analyst*, 2009, **134**, 2344

DOI: 10.1039/b918259d

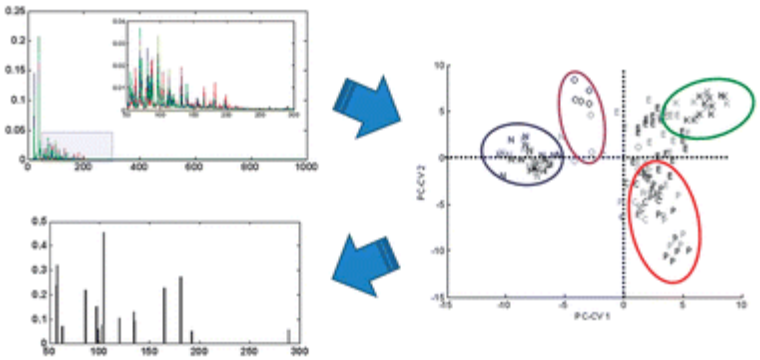


Application of iPLS and iECVA to HR ^{1}H NMR spectra efficiently reveals biomarkers for onion in urine.

Explanatory multivariate analysis of ToF-SIMS spectra for the discrimination of bacterial isolates

Seetharaman Vaidyanathan, John S. Fletcher, Roger M. Jarvis, Alex Henderson, Nicholas P. Lockyer, Royston Goodacre and John C. Vickerman, *Analyst*, 2009, **134**, 2352

DOI: 10.1039/b907570d



An explanatory analysis on the ToF-SIMS spectra used for the discrimination of bacterial isolates associated with UTI enabled identification of 37 peaks contributing to the discrimination, and an understanding of the discriminatory basis with possible biological origins.

Thyroid tissue analysis through Raman spectroscopy

Caroline S. B. Teixeira, Renata A. Bitar, Herculano S. Martinho, André B. O. Santos, Marco A. V. Kulcsar, Celso U. M. Friguglietti, Ricardo B. da Costa, Emilia Â. L. Arisawa and Airton A. Martin, *Analyst*, 2009, **134**, 2361

DOI: 10.1039/b822578h

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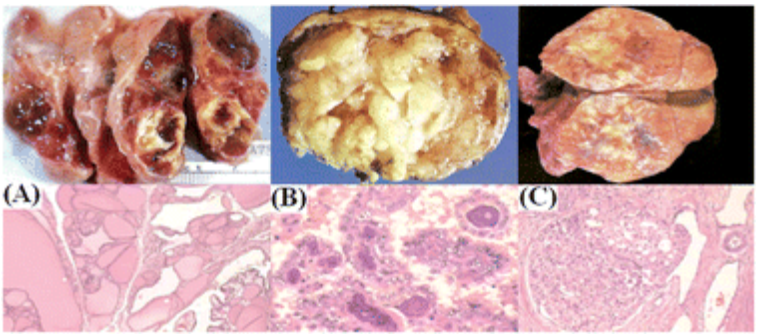

Biochemical alterations, represented by their FT-Raman spectra, were identified that could possibly be used to classify histologic groups of the thyroid.

Back cover

Analyst, 2009, **134**, 2371

DOI: 10.1039/b920641h