

The Analyst

Interdisciplinary detection science

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IN THIS ISSUE

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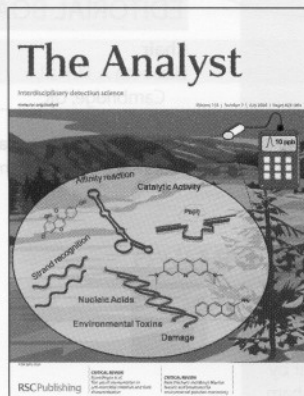


Cover

See S. Abele, F.-Q. Nie, F. Foret, B. Paull and M. Macka, pp. 864–866.

Setup for the UV-LED photoinitiated polymerisation of monoliths in the channels of a microfluidic chip – 375 nm light emitting diode shining across masked channels of a PMMA chip.

Image reproduced by permission of Mirek Macka from *Analyst*, 2008, **133**, 864.



Inside cover

See I. Palchetti and M. Mascini, pp. 846–854.

Nucleic acid biosensors are finding increasing use for the detection of environmental pollution and toxicity.

Image reproduced by permission of Marco Mascini from *Analyst*, 2008, **133**, 846.

CHEMICAL TECHNOLOGY

T49

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

July 2008/Volume 5/Issue 7

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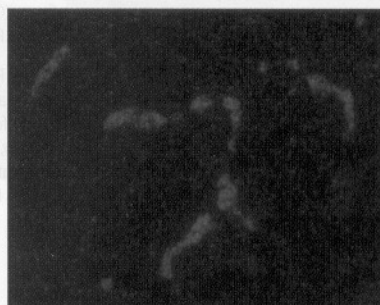
CRITICAL REVIEWS

835

The use of nanoparticles in anti-microbial materials and their characterization

Emma Weir, Antoin Lawlor, Aine Whelan and Fiona Regan*

Some metal nanoparticles are known to possess antibacterial properties. This review describes techniques for the characterization of nanoparticle-doped materials and methods for determining their efficacy against biofilm formation.

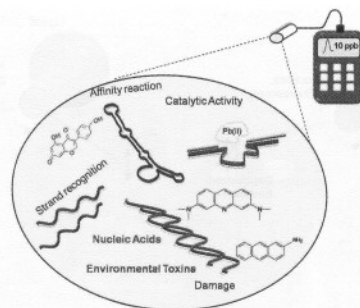


846

Nucleic acid biosensors for environmental pollution monitoring

Ilaria Palchetti and Marco Mascini*

This review focuses on the use of nucleic acid biosensors giving a flavour of environmental pollutant detection using nucleic acids (genomic DNA, synthetic oligonucleotides, aptamers, aptazymes, DNazymes) as biorecognition elements.



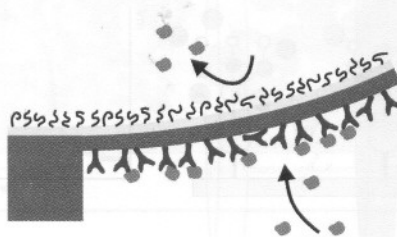
TUTORIAL REVIEW

855

Cantilever biosensors

Jürgen Fritz*

Cantilever biosensors have recently shown promising results in the detection of nucleic acids and proteins. A general introduction to biosensors, the experimental setups of cantilever sensors, and their mode of operation are presented and key results from biosensing applications and current theoretical descriptions are reviewed.



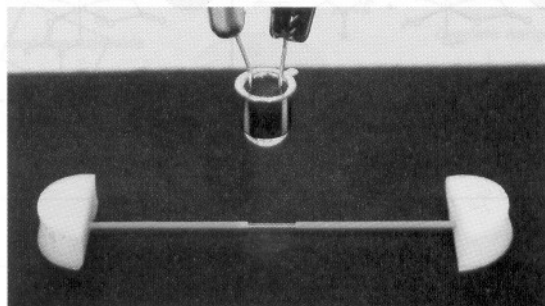
COMMUNICATIONS

864

UV-LED photopolymerised monoliths

Silvija Abele, Fu-Qiang Nie, František Foret, Brett Paull and Mirek Macka*

Photopolymerisation of polymer monoliths has been realised with UV-LEDs as the light source and demonstrated with polymethacrylate monoliths created in fused silica capillaries and plastic chips.

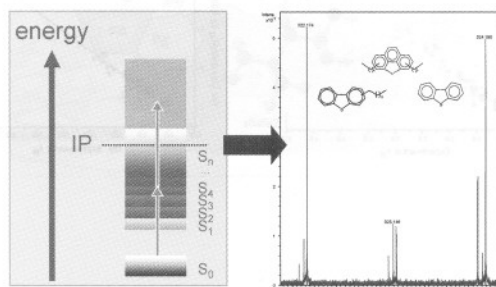


867

Characterization of non-polar aromatic hydrocarbons in crude oil using atmospheric pressure laser ionization and Fourier transform ion cyclotron resonance mass spectrometry (APLI FT-ICR MS)

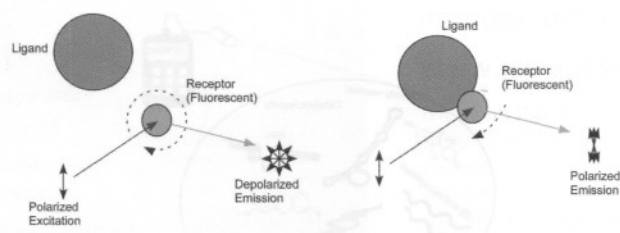
Wolfgang Schrader,* Saroj K. Panda, Klaus J. Brockmann and Thorsten Benter*

The analysis of vacuum gas oil components using an atmospheric pressure laser ionization (APLI) source coupled to a Fourier transform ion cyclotron resonance mass spectrometer is reported.



APLI = (1+1) REMPI at atmospheric pressure

870

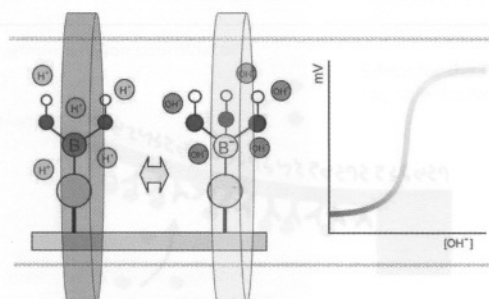


Measuring complexation by single-molecule fluorescence anisotropy

Sean M. Burrows and Dimitri Pappas*

Fluorescence anisotropy is used as a measure of binding of single-molecule pairs to observe rare events and heterogeneities of an affinity complex.

874



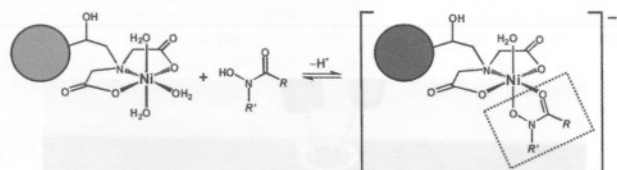
Accurate non-invasive determination of pK_a of surface functionalised ion exchange monoliths using capacitively coupled contactless conductivity detection

Eoin Gillespie, Damian Connolly, Pavel N. Nesterenko and Brett Paull*

A novel application of capacitively coupled contactless conductivity for the accurate determination of the pK_a of bonded ionic groups within a polymer monolithic column is shown.

PAPERS

877

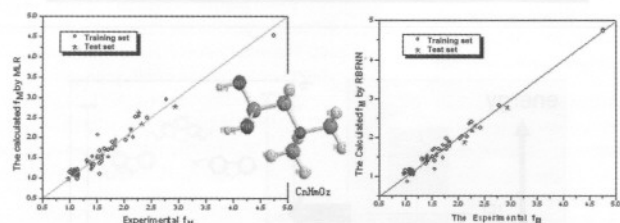


Immobilised metal affinity chromatography for the capture of hydroxamate-containing siderophores and other Fe(III)-binding metabolites directly from bacterial culture supernatants

Najwa Braich and Rachel Codd*

Nickel(II)-based immobilised metal affinity chromatography of the crude, untreated supernatant from Fe(III)-deprived cultures of the desferrioxamine B-producing bacterium, *Streptomyces pilosus*, yields four unique Fe(III)-responsive species from a complex mixture, one of which is desferrioxamine B.

881



Prediction of quantitative calibration factors of some organic compounds in gas chromatography

Feng Luan,* Hui Tao Liu, Yingying Wen and Xiaoyun Zhang

The experimental determination of calibration factors is time consuming and it requires the use of pure compounds. QSPR, on the other hand, estimates calibration factors based on descriptors derived from the molecular structure alone.

888

Carbon nanotube-based electrochemical sensors for quantifying the heat of chilli peppers: the adsorptive stripping voltammetric determination of capsaicin

Roohollah Torabi Kachoosangi, Gregory G. Wildgoose and Richard G. Compton*

Capsaicin is the chemical responsible for the hot taste of chilli peppers, and measuring its concentration is an indicator of how hot any chilli pepper or related foodstuff will be. A new, sensitive electroanalytical method for determining capsaicin levels, which is an alternative to the Scoville method based on human tasting panels, is presented.

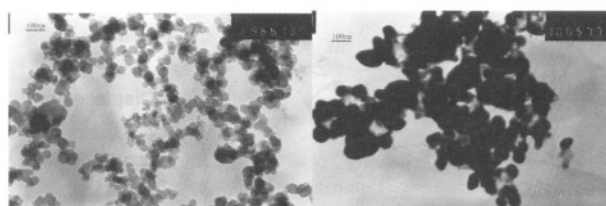


896

Fluorescence enhancement effect of morin-nucleic acid-L-cysteine-capped nano-ZnS system and the determination of nucleic acid

Liangliang Zhao, Xia Wu,* Honghong Ding and Jinghe Yang*

L-Cysteine-capped nano-ZnS was prepared, and it was applied into the system of morin-nucleic acid, the complex of morin-L-cysteine-capped nano-ZnS-nucleic acid was formed, leading to the fluorescence intensity being greatly enhanced and the fluorescence photobleaching property was improved.



L-cysteine-capped nano-ZnS

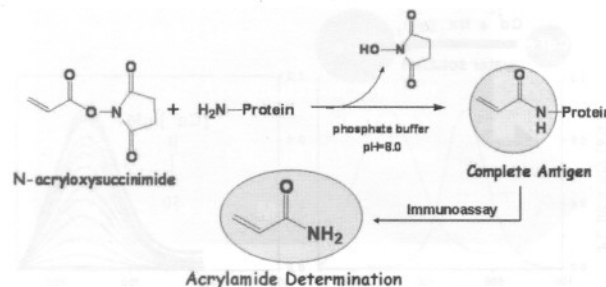
complex of morin-L-cysteine-capped nano-ZnS-nucleic acid

903

Antigen synthetic strategy and immunoassay development for detection of acrylamide in foods

Shuang Zhou, Chen Zhang, Dan Wang and Meiping Zhao*

A unique strategy is proposed for the synthesis of a complete antigen for acrylamide by using *N*-acryloxysuccinimide (NAS) as the hapten instead of acrylamide itself.

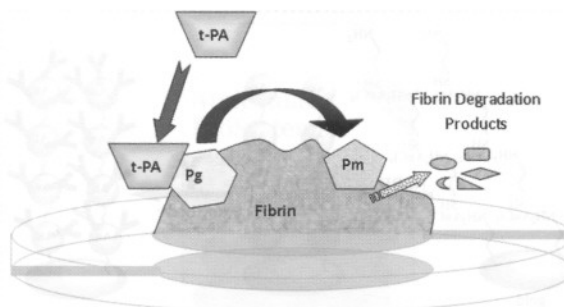


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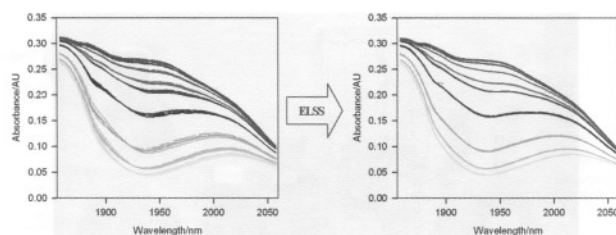
One-step thickness shear mode acoustic assay for plasminogen activators

Mirnader Ghazali and Gordon L. Hayward

A new procedure is presented for the measurement of plasminogen activators using a thickness shear mode sensor and a modified version of the fibrin plate assay at the micro-scale.



914

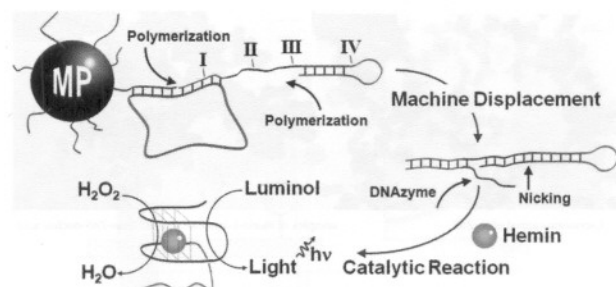


Improving the linearity of spectroscopic data subjected to fluctuations in external variables by the extended loading space standardization

Zeng-Ping Chen* and Julian Morris

A new chemometric method named Extended Loading Space Standardization (ELSS) is proposed to correct the potential detrimental influences of the fluctuations in external variables on the linearity of spectroscopic data.

923

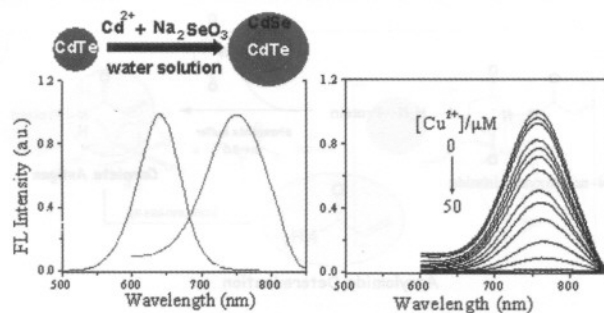


Analysis of DNA and single-base mutations using magnetic particles for purification, amplification and DNAzyme detection

Itamar Willner,* Zoya Cheglakov, Yossi Weizmann and Etteri Sharon

Sensitive chemiluminescence detection of DNA or single-base mismatches is accomplished by the magnetic separation of the analyte DNA, followed by the activation of the autonomous synthesis of reporter DNAzyme units.

928

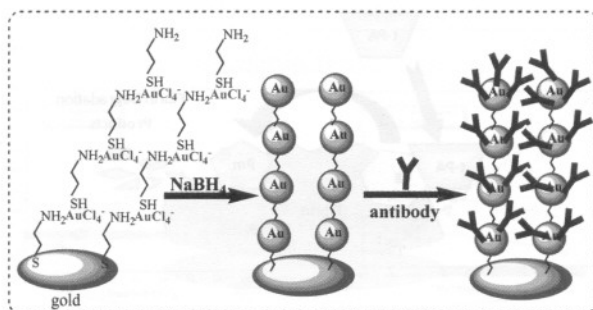


Aqueous synthesis of type-II core/shell CdTe/CdSe quantum dots for near-infrared fluorescent sensing of copper(II)

Yunsheng Xia and Changqing Zhu*

Type-II core/shell CdTe/CdSe quantum dots (QDs) were synthesized in aqueous medium and used to develop a simple and rapid method for Cu(II) determination.

933



Quartz crystal microbalance immunoassay for carcinoma antigen 125 based on gold nanowire-functionalized biomimetic interface

Dianping Tang, Ruo Yuan* and Yaqin Chai

Gold nanowires with of designed length on a solid substrate have been proven as an efficiently immobilized affinity support for the detection of carcinoma antigen 125 (CA 125) in this study.

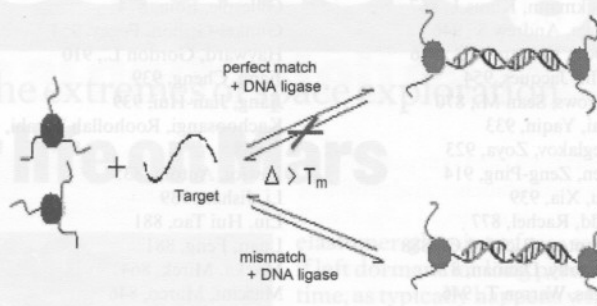
PAPERS

939

Simultaneous identification of point mutations *via* DNA ligase-mediated gold nanoparticle assembly

Jishan Li, Jian-Hui Jiang,* Xiang-Min Xu, Xia Chu, Cheng Jiang, Guoli Shen* and Ru-Qin Yu

Based on the allelic specificity of DNA ligase and gold nanoparticles modified by oligonucleotide probes, a novel approach for a genotyping assay that could achieve simultaneous identification of multiple point mutations *via* a ligase-mediated gold nanoparticle assembly is described.

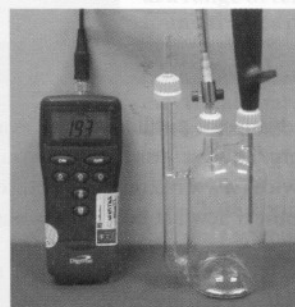


946

Establishing SI traceability for measurements of mercury vapour

Andrew S. Brown,* Richard J. C. Brown, Warren T. Corns and Peter B. Stockwell

A direct link between measurements of mercury vapour and standards of mass is presented, thus establishing traceability for these key environmental measurements to the SI system of units.

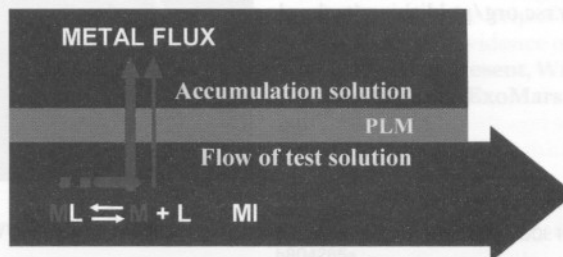


954

Speciation of Cu(II) with a flow-through permeation liquid membrane: discrimination between free copper, labile and inert Cu(II) complexes, under natural water conditions

Peggy Gunkel-Grillon and Jacques Buffle*

The Permeation Liquid Membrane (PLM) technique enables discrimination between the free metal (M), labile (ML) and inert complexes (MI) by varying the flow-rate of the test solution.



MOLECULAR BIOSYSTEMS

It's official, *Molecular BioSystems* has separated from host journal, *Chemical Communications*, and is now a fully fledged solo publication. Its availability since launch to readers of *Chemical Communications* and the online hosts, *Organic & Biomolecular Chemistry*, *Lab on a Chip*, *The Analyst* and *Analytical Abstracts*, has ensured that *Molecular BioSystems* received a large and interdisciplinary audience from the outset. *Analyst* readers wishing to continue to read *Molecular BioSystems* now need to recommend the journal to their librarian. Fill in the online recommendation form at www.rsc.org/libraryrecommendation



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