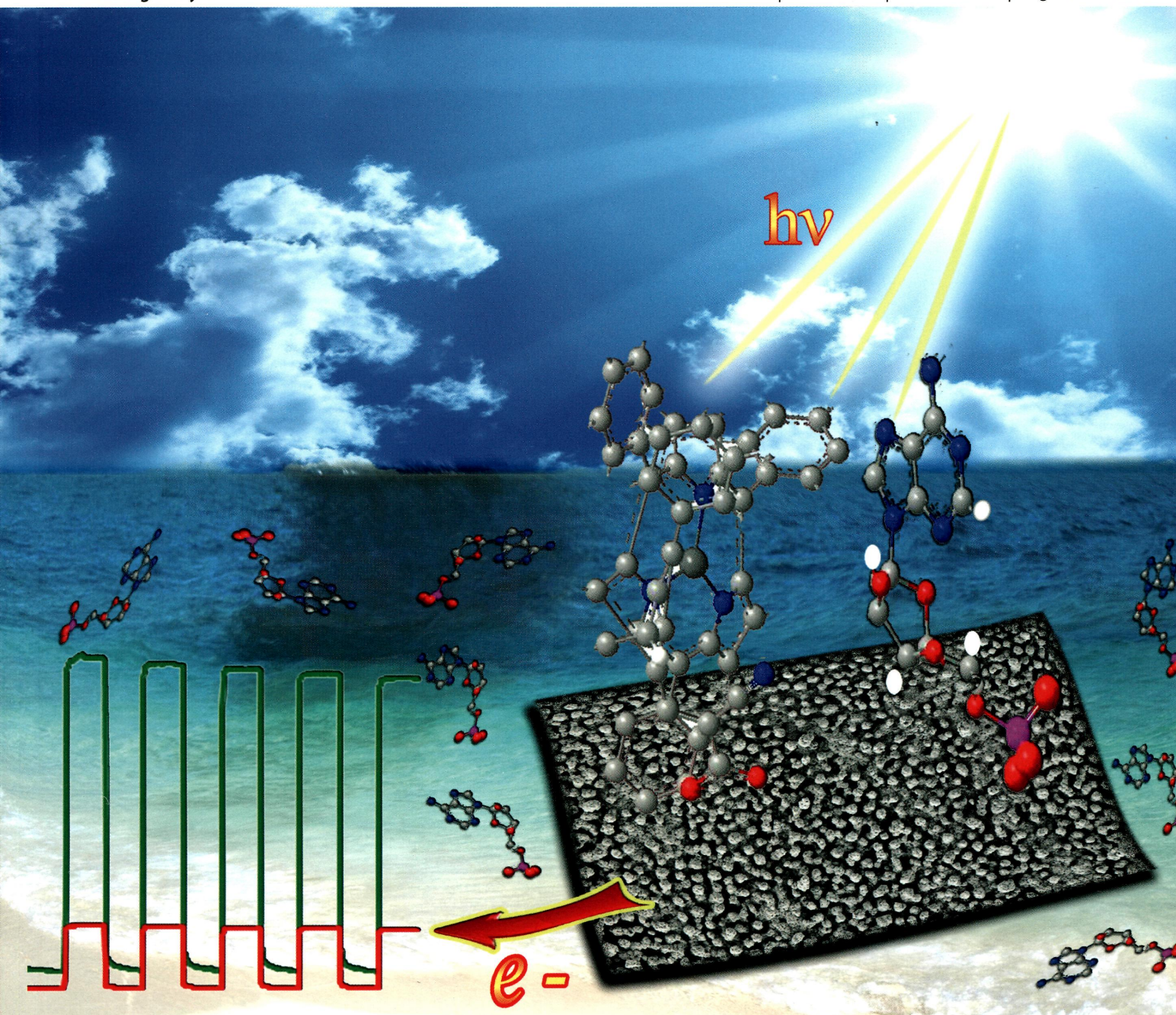


Analyst

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Volume 138 | Number 12 | 21 June 2013 | Pages 3323–3562



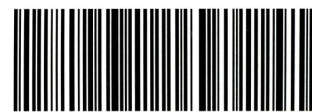
ISSN 0003-2654

RSC Publishing

HOT ARTICLE

Yi-Tao Long, Heinz-Bernhard Kraatz *et al.*

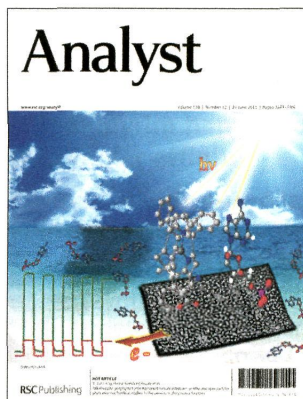
Tailoring zinc porphyrin to the Ag nanostructure substrate: an effective approach for photoelectrochemical studies in the presence of mononucleotides



0003-2654 (2013) 138:12;1-Z

IN THIS ISSUE

ISSN 0003-2654 CODEN ANALAO 138(12) 3323–3562 (2013)



Cover

See Yi-Tao Long, Heinz-Bernhard Kraatz *et al.*, pp. 3380–3387. Image reproduced by permission of Yi-Tao Long from *Analyst*, 2013, **138**, 3380.



Inside cover

See Tarkeshwar Gupta *et al.*, pp. 3356–3359. Image reproduced by permission of Tarkeshwar Gupta from *Analyst*, 2013, **138**, 3356.

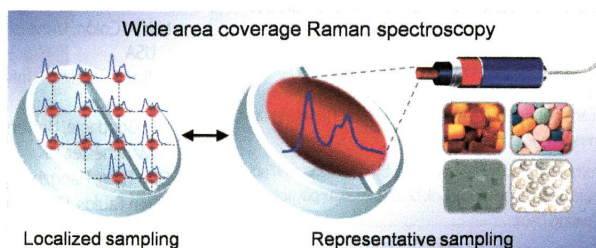
MINIREVIEW

3335

Wide area coverage Raman spectroscopy for reliable quantitative analysis and its applications

Kayeong Shin and Hoeil Chung*

This review summarizes recent studies to improve sample representation in Raman measurement by covering a large area of a sample in spectral collection.



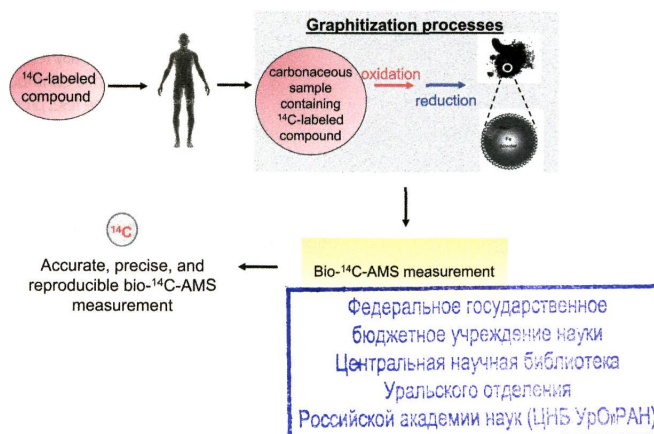
TUTORIAL REVIEW

3347

Biological and biomedical ^{14}C -accelerator mass spectrometry and graphitization of carbonaceous samples

Ill-Min Chung and Seung-Hyun Kim*

Accurate and reproducible bio- ^{14}C -AMS for *in vivo* human PK and ADME of food components, nutrients, new drugs, and environmental chemicals.

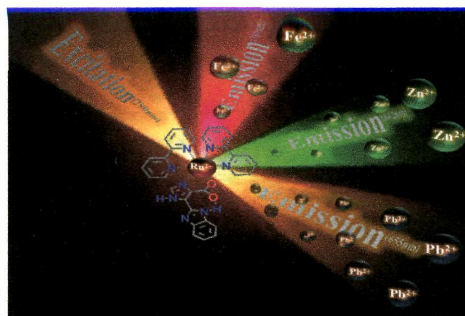


3356

A stimuli-responsive "smart probe" for selective monitoring of multiple-cations *via* differential analyses

Anup Kumar, Alok K. Singh and Tarkeshwar Gupta*

Differential fluorescence responses of a benzimidazole-based ternary ruthenium complex containing multiple ionophores *viz.* carbonyl, amine, and imine after interaction with various metal ion stimuli at parts-per-million concentrations permit selective recognition of Pb^{2+} , Fe^{2+} and Zn^{2+} at a single platform using a single optical technique.

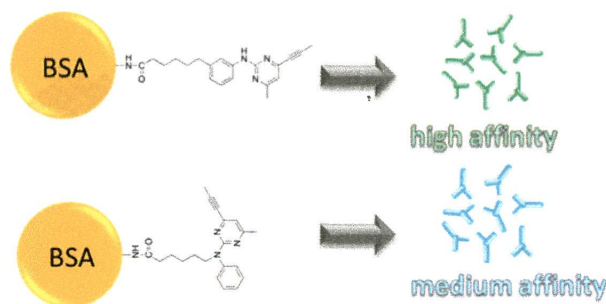


3360

Mepanipyrim haptens and antibodies with nanomolar affinity

Francesc A. Esteve-Turrillas, Josep V. Mercader, Consuelo Agulló, Antonio Abad-Somovilla and Antonio Abad-Fuentes*

Hapten synthesis and antibody production for immunodetection of the anilinopyrimidine fungicide mepanipyrim are reported for the first time.

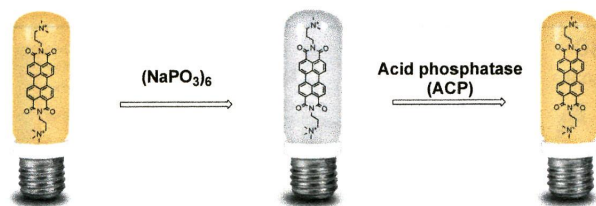


3365

A novel fluorescent "Turn-Off/Turn-On" system for the detection of acid phosphatase activity

Pu Guo, Shengyong Yan, Yimin Zhou, Changcheng Wang, Xiaowei Xu, Xiaocheng Weng and Xiang Zhou*

Acid phosphatase (ACP) can be detected *via* a fluorescent "Turn-Off/Turn-On" system with inexpensive $(\text{NaPO}_3)_6$ as a quencher of the probe.

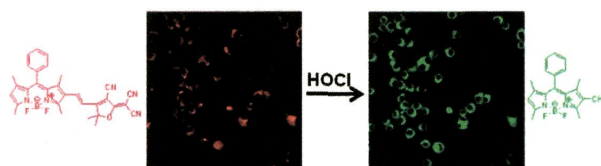


3368

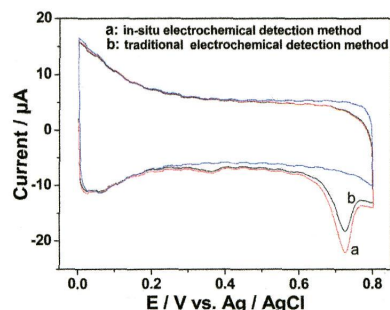
A ratiometric fluorescent probe based on a BODIPY-DCDHF conjugate for the detection of hypochlorous acid in living cells

Jeesook Park, Hyunjin Kim, Yongdoo Choi* and Youngmi Kim*

A colorimetric and ratiometric fluorescent probe consisting of a boron-dipyrromethene (BODIPY) dye conjugated with 2-dicyanomethylene-3-cyano-2,5-dihydrofuran (DCDHF) has been designed for detection of HOCl *via* oxidative cleavage of an alkene linker between BODIPY and DCDHF.



3372

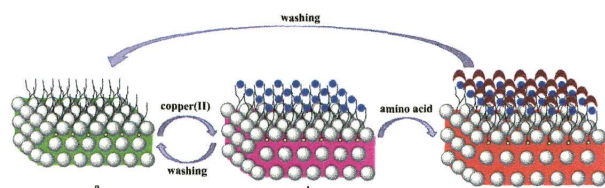


An *in situ* electrochemical detection method of cell viability

Hongwei Qin, Qingdong Gao, Huiming Niu, Zhefeng Wang, Xiaolin Zhu, Jinlian Li, Xing Yuan* and Dongmei Wu*

A novel and simple *in situ* electrochemical detection method of cell viability was developed.

3376



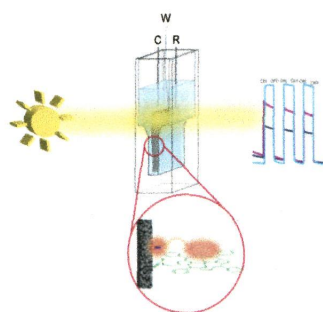
A novel platform for sensing an amino acid by integrating hydrogel photonic crystals with ternary complexes

Mei Liu and Li-Ping Yu*

A novel sensing platform based on the integration of hydrogel photonic crystals and ternary tetracycline-copper(II)-amino acid complexes.

PAPERS

3380

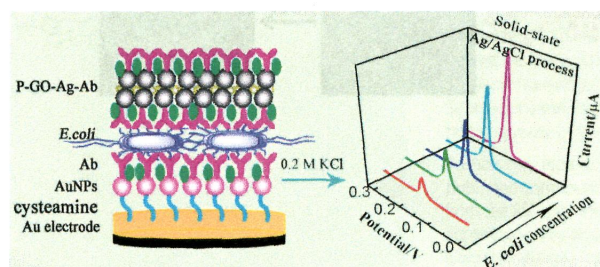


Tailoring zinc porphyrin to the Ag nanostructure substrate: an effective approach for photoelectrochemical studies in the presence of mononucleotides

Farkhondeh Fathi, Cong Kong, Yueqiang Wang, Yongshu Xie, Yi-Tao Long* and Heinz-Bernhard Kraatz*

Mononucleotides influence the photoelectrochemical response of a Zn porphyrin chemically linked to a nanostructured Ag surface.

3388



Solid-state voltammetry-based electrochemical immunosensor for *Escherichia coli* using graphene oxide–Ag nanoparticle composites as labels

Xiaochun Jiang, Kun Chen, Jing Wang, Kang Shao, Tao Fu, Feng Shao, Donglian Lu, Jiangong Liang, M. Frahat Foda and Heyou Han*

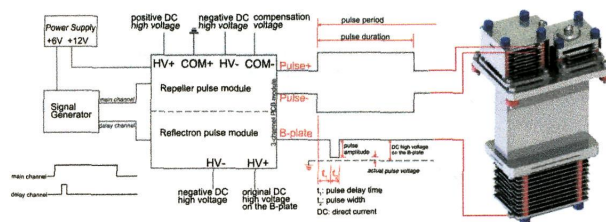
A new electrochemical immunosensor for *Escherichia coli* was fabricated based on solid-state voltammetry by using graphene oxide–Ag nanoparticle nanocomposites (P-GO–Ag) as labels.

3394

A miniaturised electron ionisation time-of-flight mass spectrometer that uses a unique helium ion removal pulsing technique specifically for gas analysis

Jiang Qing, Zhengxu Huang, Yan Zhang, Hui Zhu, Guobin Tan, Wei Gao* and Peng-yuan Yang*

A pulsing device for the removal of helium ions is designed and coupled to a miniaturised electron ionisation time-of-flight mass spectrometer for gas analysis.

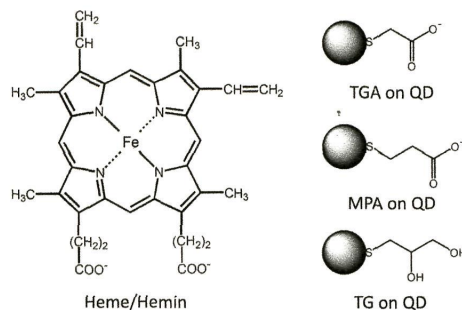


3402

Employing aqueous CdTe quantum dots with diversified surface functionalities to discriminate between heme (Fe(II)) and hemin (Fe(III))

Jishu Han, Ziwei Zhou, Xinyuan Bu, Shoujun Zhu, Hao Zhang,* Haizhu Sun* and Bai Yang

Heme and hemin are discriminated between on the basis of the fluorescence quenching of aqueous CdTe QDs with diversified surface functionalities that greatly influence their electrostatic interaction in aqueous media.

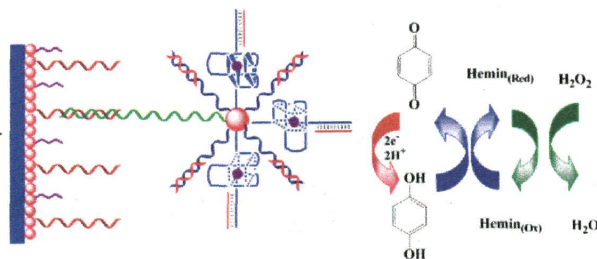


3409

Electrochemical determination of microRNA-21 based on bio bar code and hemin/G-quadruplet DNAenzyme

Xiaomeng Meng, Yunlei Zhou, Qianjin Liang, Xiangjin Qu, Qingqing Yang, Huanshun Yin* and Shiyun Ai*

A microRNA biosensor was developed using DNA-Au bio bar code and G-quadruplex-based DNAenzyme and applied to detect miRNA-21 from human hepatocarcinoma and mastocarcinoma cell lines.

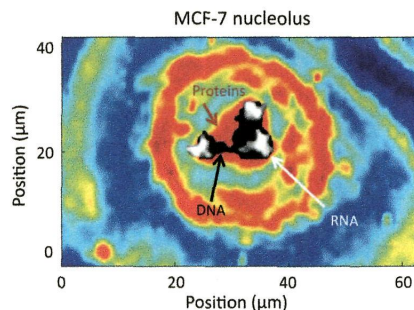


3416

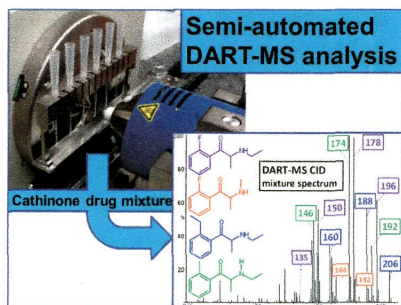
Label-free imaging of mammalian cell nucleoli by Raman microspectroscopy

H. Georg Schulze, Stanislav O. Konorov, James M. Piret, Michael W. Blades* and Robin F. B. Turner*

Label-free differential chemical imaging of the nucleolus and its substructure by Raman microspectroscopy reveals the distribution of its macromolecular components.



3424

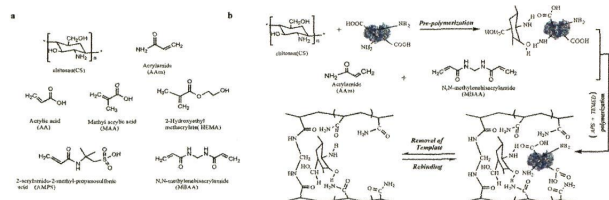


Direct analysis in real time mass spectrometry (DART-MS) of "bath salt" cathinone drug mixtures

Ashton D. Lesiak, Rabi A. Musah, Robert B. Cody, Marek A. Domin, A. John Dane and Jason R. E. Shepard*

DART-MS methods for rapid and versatile detection and characterization of synthetic cathinone designer drug mixtures, also known as "bath salts" were developed.

3433

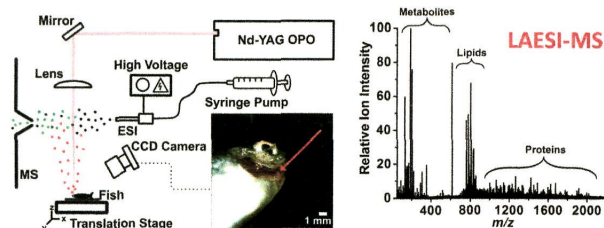


The synthesis of molecular imprinted chitosan-gels copolymerized with multifunctional monomers at three different temperatures and the recognition for the template ovalbumin

Ran Dan, Yuzhi Wang,* Lin Du, Shuhua Du, Meidong Huang, Shan Yang and Min Zhang

Molecularly imprinted polymers (MIPs) have been prepared to recognize the template ovalbumin.

3444

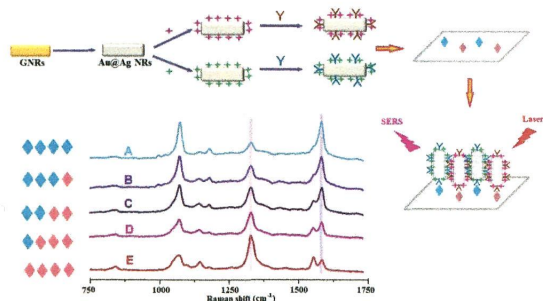


Comparative local analysis of metabolites, lipids and proteins in intact fish tissues by LAESI mass spectrometry

Bindesh Shrestha, Robert Javonillo, John R. Burns, Zsolt Pirger and Akos Vertes*

Analysis of fish gills by LAESI mass spectrometry revealed the presence of a protein specific to mature males of a species.

3450



Simultaneous evaluation of p53 and p21 expression level for early cancer diagnosis using SERS technique

Lei Wu, Zhuyuan Wang, Shenfei Zong, Hui Chen, Chunlei Wang, Shuhong Xu and Yiping Cui*

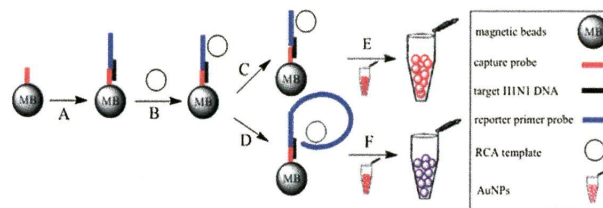
We report a SERS-based multiplex detection of p53 and p21 for early cancer diagnosis with high sensitivity and improved efficiency.

3457

A colorimetric method for H1N1 DNA detection using rolling circle amplification

Yasi Xing, Ping Wang, Yucui Zang, Yuqing Ge, Qinghui Jin, Jianlong Zhao, Xia Xu,* Guoqiang Zhao* and Hongju Mao*

This study established a highly sensitive colorimetry-based rolling circle amplification assay for H1N1 DNA detection.

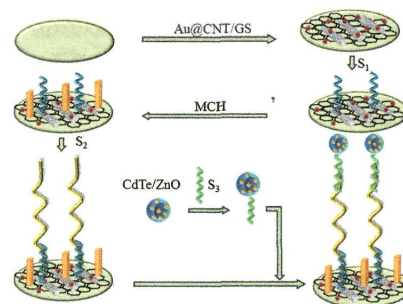


3463

Ultrasensitive electrochemiluminescence detection of lengthy DNA molecules based on dual signal amplification

Fang Liu, Heng Liu, Meng Zhang, Jinghua Yu,* Shaowei Wang and Juanjuan Lu

Ultrasensitive detection of overlong DNA molecules based on Au@CNT-GS platform and CdTe-ZnO signal amplification.

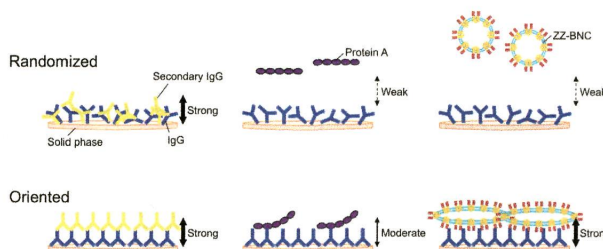


3470

Nanocapsule-based probe for evaluating the orientation of antibodies immobilized on a solid phase

Masumi Iijima, Nobuo Yoshimoto, Tomoaki Niimi, Andrés Daniel Maturana and Shun'ichi Kuroda*

Bio-nanocapsules displaying IgG Fc-binding Z domains (ZZ-BNC) can discriminate the IgGs fixed in an oriented- and randomized-immobilization manner.

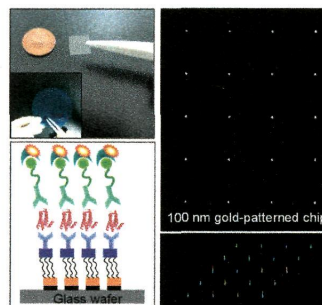


3478

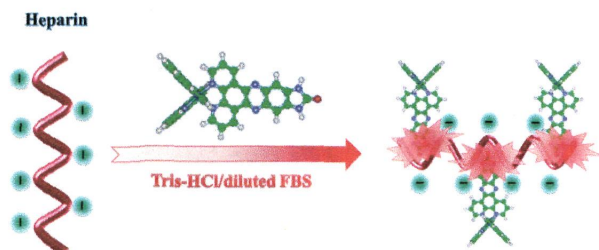
Gold-nanopatterned single interleukin-6 sandwich immunoassay chips with zeptomolar detection capability based on evanescent field-enhanced fluorescence imaging

Seungah Lee and Seong Ho Kang*

A novel single IL-6 sandwich immunoassay chip with 100 nm Au spots based on an ultra-sensitive TIRFM system.



3483

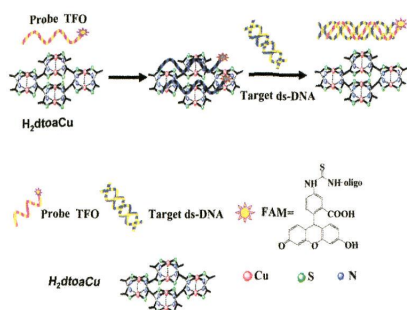


A new fluorescence "switch on" assay for heparin detection by using a functional ruthenium polypyridyl complex

Ting-Ting Cheng, Jun-Liang Yao, Xing Gao, Wenliang Sun, Shuo Shi* and Tian-Ming Yao*

A new fluorescence "switch on" sensor for heparin detection is presented based on a functional ruthenium polypyridyl complex ($[\text{Ru}(\text{phen})_2\text{dppz-idzo}]^{2+}$).

3490

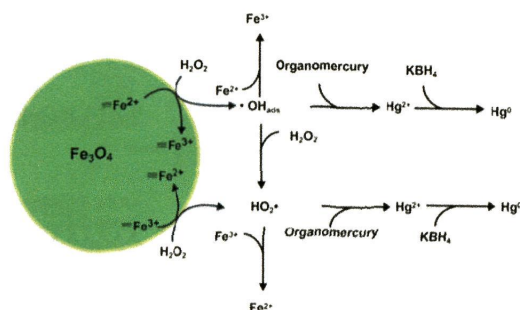


Metal-organic frameworks-based biosensor for sequence-specific recognition of double-stranded DNA

Lifen Chen, Hanye Zheng, Xi Zhu, Zhenyu Lin,* Longhua Guo, Bin Qiu, Guonan Chen and Zhong-Ning Chen*

A fluorescence sensor is developed for sequence-specific recognition of duplex DNA *in vitro* using a metal-organic framework as the sensing platform.

3494

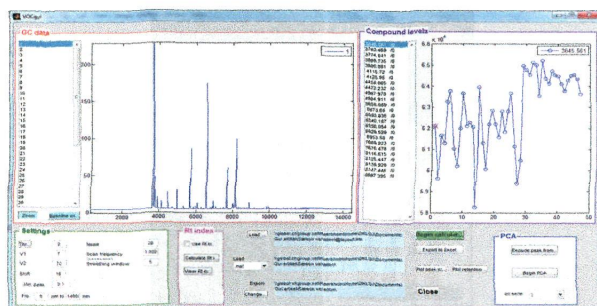


Advanced oxidation using Fe_3O_4 magnetic nanoparticles and its application in mercury speciation analysis by high performance liquid chromatography-cold vapor generation atomic fluorescence spectrometry

Xi Ai, Yu Wang, Xiandeng Hou, Lu Yang, Chengbin Zheng* and Li Wu*

A novel post-column oxidation method using Fe_3O_4 magnetic nanoparticles was developed for the speciation analysis of mercury.

3502



An automated method for baseline correction, peak finding and peak grouping in chromatographic data

Lea G. Johnsen,* Thomas Skov, Ulf Houlberg and Rasmus Bro

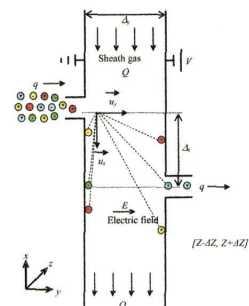
An automated method (FastChrom) for baseline correction, peak detection and assignment (grouping) of similar peaks across samples has been developed. The method includes a new method for baseline estimation.

3512

A novel differential mobility analyzer as a VOC detector and multivariate techniques for identification and quantification

V. Pomareda, S. Lopez-Vidal,* D. Calvo, A. Pardo and S. Marco

A Differential Mobility Analyser (DMA) is a specific configuration of an Ion Mobility Spectrometer (IMS) where ions with different electrical mobilities are separated in space, instead of in time of drift, as in classical drift-time IMS.

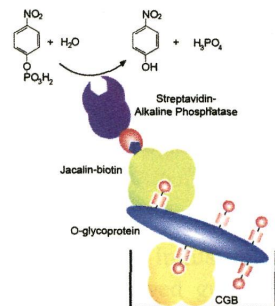


3522

An improved lectin-based method for the detection of mucin-type O-glycans in biological samples

Cheng-Siang Lee, Arivalagan Muthusamy, Puteri Shafinaz Abdul-Rahman, Veer P. Bhavanandan and Onn Haji Hashim*

Mucin type O-glycans were specifically captured by champedak galactose binding lectin, which was then probed using biotinylated jacalin. Our newly developed method improves the detection sensitivity for the O-glycans in biological samples such as serum.

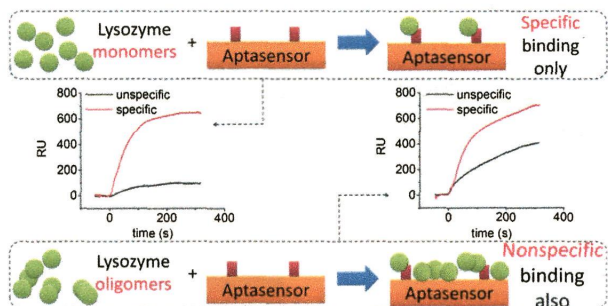


3530

Development of a label-free aptasensor for monitoring the self-association of lysozyme

Alina Vasilescu,* Szilveszter Gaspar, Iuliana Mihai, Andreia Tache and Simona Carmen Litescu

A novel aptamer and SPR-based sensor was applied for monitoring the early stages of lysozyme aggregation.

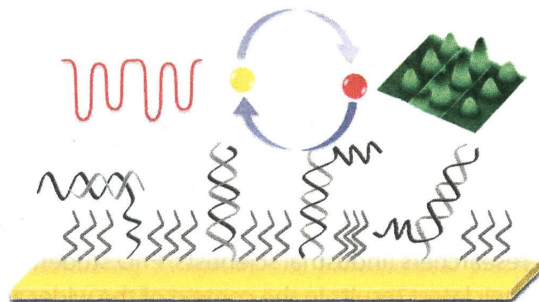


3538

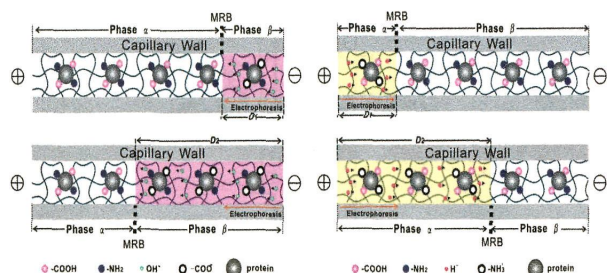
Electrochemical signature of mismatch in overhang DNA films: a scanning electrochemical microscopic study

Mohtashim Hassan Shamsi and Heinz-Bernhard Kraatz*

High throughput DNA basepair mismatch detection is an ultimate goal for earlier and point-of-care diagnostics.



3544

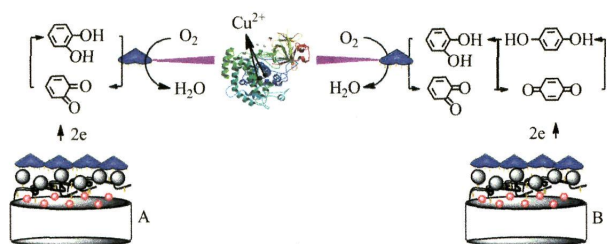


Determination of free acidic and alkaline residues of protein *via* moving reaction boundary titration in microdevice electrophoresis

Hou-yu Wang, Si Li, Yun-yun Tang, Jing-yu Dong, Liu-yin Fan and Cheng-xi Cao*

Rapid and direct determination of acidic and alkaline residues of protein *via* moving reaction boundary electrophoretic titration is reported.

3552



A tyrosinase biosensor based on ordered mesoporous carbon-Au/L-lysine/Au nanoparticles for simultaneous determination of hydroquinone and catechol

Lin Tang,* Yaoyu Zhou, Guangming Zeng,* Zhen Li, Yuanyuan Liu, Yi Zhang, Guiqiu Chen, Guide Yang, Xiaoxia Lei and Mengshi Wu

A tyrosinase biosensor based on nano-porous-structured carbon-Au was applied in the simultaneous determination of dihydroxybenzene isomers.

Analytical Division

Analytical Research Forum 2013

8-10 July 2013

GlaxoSmithKline & the University of Hertfordshire, UK

The annual Analytical Research Forum (ARF) is the premier Analytical Science meeting of the RSC. The meeting is primarily for early-stage analytical science researchers (industrial scientists, PhD students and postdoctoral fellows) to present their latest results in the context of the wider analytical science community.

This year there will be site visits to GlaxoSmithKline laboratories in Stevenage.

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