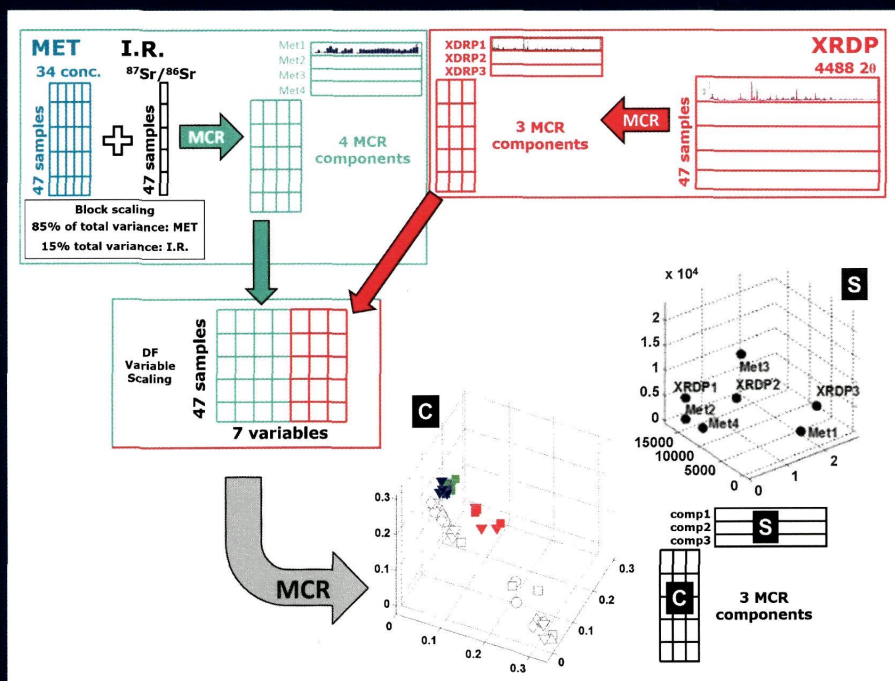




ANALYTICA CHIMICA ACTA

AN INTERNATIONAL JOURNAL DEVOTED TO ALL BRANCHES OF ANALYTICAL CHEMISTRY



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Featured Article

Application of data fusion techniques to direct geographical traceability indicators

Michele Silvestri, Lucia Bertacchini, Caterina Durante, Andrea Marchetti, Elisa Salvatore and Marina Cocchi

(Published on pp. 1–9 of this issue)

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Editorial Board

Page iii

Featured Article



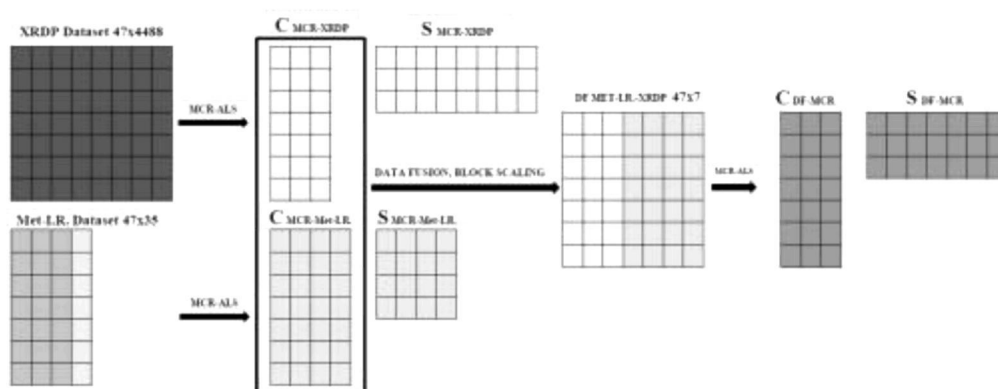
Application of data fusion techniques to direct geographical traceability indicators

Original Research Article

Pages 1-9

Michele Silvestri, Lucia Bertacchini, Caterina Durante, Andrea Marchetti, Elisa Salvatore, Marina Cocchi

Graphical abstract



Highlights

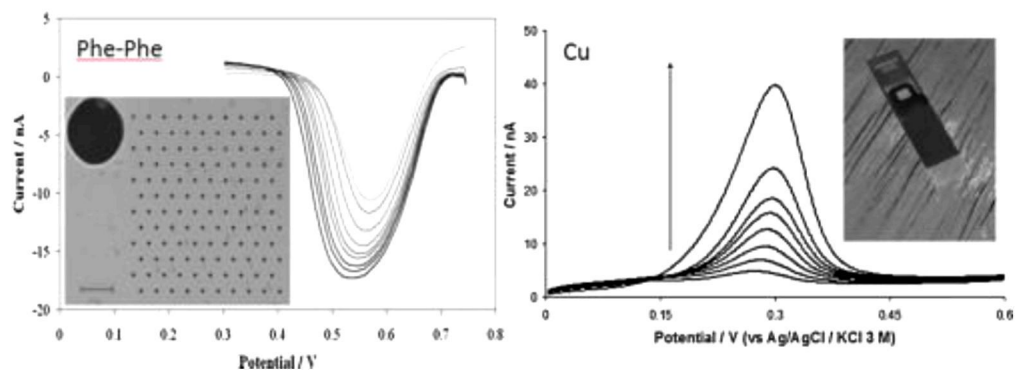
► Data fusion is applied to XRPD profiles, metal contents and isotopic ratio $^{87}\text{Sr}/^{86}\text{Sr}$ data to characterize soils samples. ► Multivariate curve resolution is used as variable reduction tool for hierarchical data fusion. ► Soil samples differences and similarity were highlighted as well as the linking relations among data blocks.

Review Article



Stripping voltammetry at micro-interface arrays: A review

Graphical abstract



Highlights

- Fabrication of arrays of metallic micro-electrodes and arrays of μ ITIES.
- Some consideration on array design and diffusion phenomena at such interfaces.
- Applications of micro-electrode arrays and μ ITIES in stripping analysis.
- Some consideration on micro-electrode arrays integration and protection.
- New frontiers/challenges for μ ITIES.

Atomic Spectrometry

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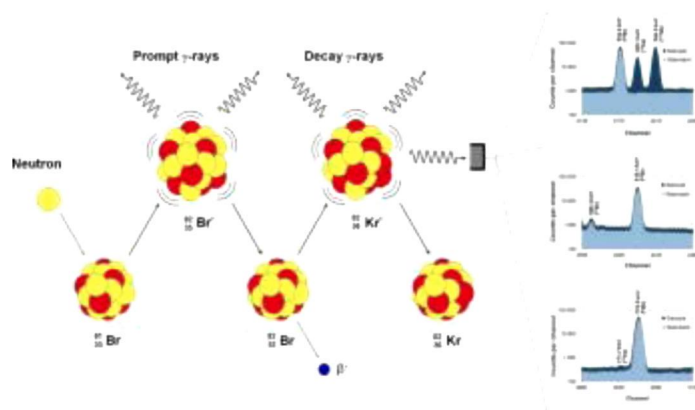
Accurate measurement of bromine contents in plastic samples by instrumental neutron activation analysis

Original Research Article

Pages 22-29

I.J. Kim, K.S. Lee, E. Hwang, H.S. Min, Y.H. Yim

Graphical abstract



Highlights

- Volatility loss of bromine from solution pipetted onto filter paper was ignorable.
- Good linearity of INAA was confirmed within a bromine content range of 10–170 μg .
- Variation of measured concentrations among samples was major source of uncertainty.

Chemometrics

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A consensus orthogonal partial least squares discriminant analysis (OPLS-DA) strategy for multiblock Omics data fusion

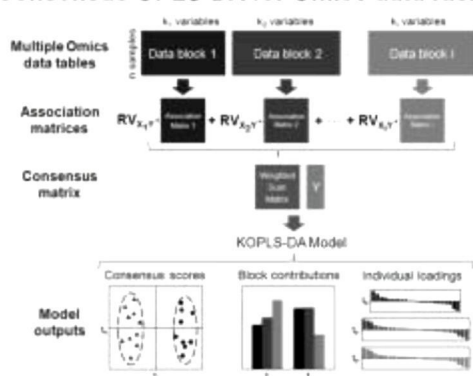
Original Research Article

Pages 30-39

Julien Boccard, Douglas N. Rutledge

Graphical abstract

Consensus OPLS-DA for Omics data fusion



Highlights

► Omics studies generate massive data obtained from different analytical devices. ► Extracting knowledge from these multiple blocks is challenging. ► A generic methodology for Omics data fusion is proposed.

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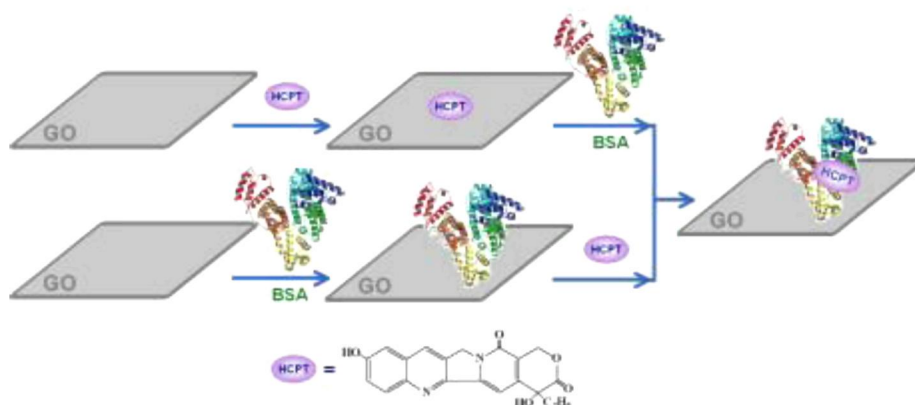
Graphene oxide as a nanocarrier for loading and delivery of medicinal drugs and as a biosensor for detection of serum albumin

Original Research Article

Pages 40-48

Yongnian Ni, Fangyuan Zhang, Serge Kokot

Graphical abstract



Highlights

► Studied the loading interaction of HCPT (10-hydroxy camptothecin) on graphene oxide. ► The nature of the interaction between graphene oxide, HCPT and BSA was investigated. ► Studied the HCPT–GO–BSA system with three-way fluorescence spectroscopy and chemometrics. ► A novel BSA biosensor was constructed with improved sensitivity and selectivity.

Electrochemistry

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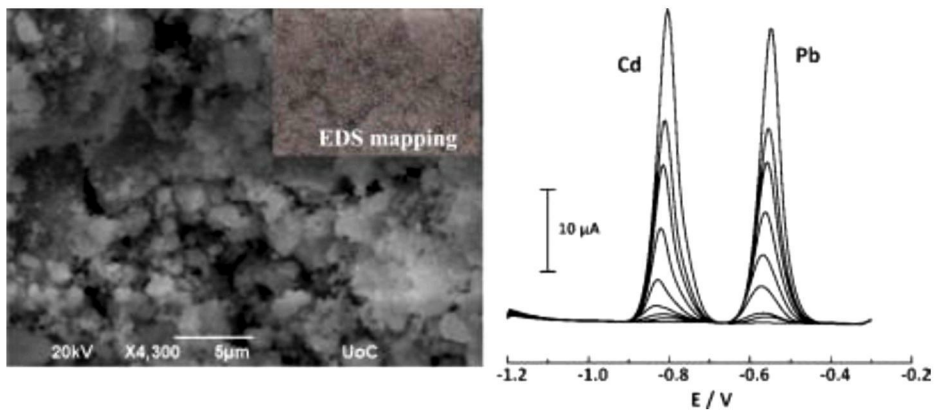
Bismuth-dispersed xerogel-based composite films for trace Pb(II) and Cd(II) voltammetric determination

Original Research Article

Pages 49-55

Panagiotis A. Dimovasilis, Mamas I. Prodromidis

Graphical abstract



Highlights

► A novel bismuth precursor, Bi-dispersed MPTMS xerogel, is proposed. ► EDS analysis showed an excellent distribution of Bi atoms in the material. ► Bi-xerogel/Nafion composite film-modified GC electrodes exhibit low LODs. ► Sensors were applied to the rapid screening of Cd(II) and Pb(II) in water samples.

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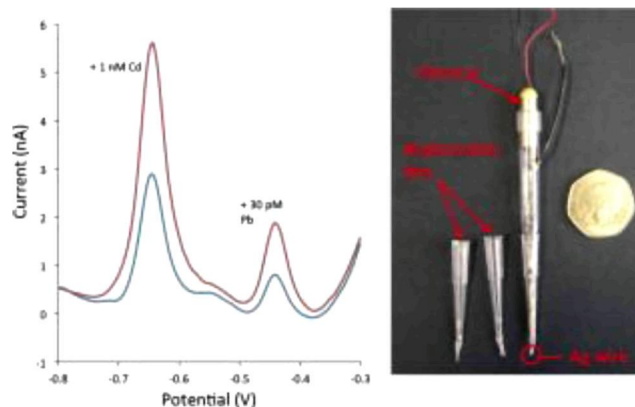
Determination of lead and cadmium in seawater using a vibrating silver amalgam microwire electrode

Original Research Article

Pages 56-64

Zhaoshun Bi, Pascal Salaün, Constant M.G. van den Berg

Graphical abstract



Highlights

► A vibrating silver amalgam microwire (SAM) is used as electrode in voltammetry. ► The SAM has sufficient sensitivity to determine Pb in uncontaminated seawater. ► The SAM is vibrated during the deposition step to increase the sensitivity. ► The new electrode and method are more sensitive than pre-existing electrodes. ► The limit of detection is 4 pM Pb and 100 pM Cd in acidified seawater.

Extraction and Sample Handling

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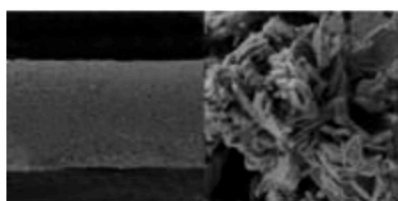
Preconcentration and determination of polybrominated diphenyl ethers in environmental water samples by solid-phase microextraction with Fe₃O₄-coated bamboo charcoal fibers prior to gas chromatography–mass spectrometry

Original Research Article

Pages 65-71

Ru-Song Zhao, Yan-Long Liu, Xiang-Feng Chen, Jin-Peng Yuan, Ai-Ying Bai, Jia-Bin Zhou

Graphical abstract



Bamboo charcoal/Fe₃O₄ fiber

SPME



PBDE chromatogram

Highlights

► Investigate the feasibility of bamboo charcoal/Fe₃O₄ as a novel SPME fiber coating material. ► Establish a SPME method for the enrichment and determination of PBDEs. ► The new coating could be reused for over 100 times without loss of extraction efficiency. ► The novel coating is much less costly than commercial coatings.

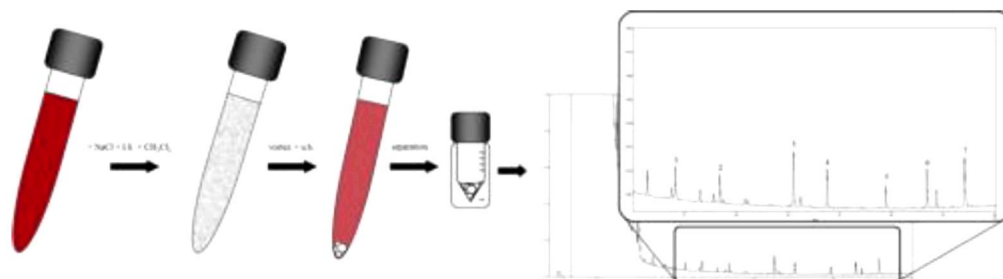
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Rapid analysis of six phthalate esters in wine by ultrasound-vortex-assisted dispersive liquid–liquid micro-extraction coupled with gas chromatography–flame ionization detector or gas chromatography–ion trap mass spectrometry

Original Research Article

Pages 72-78

Graphical abstract



Highlights

- Micro-extraction procedure was developed for rapid PAE analysis in wine samples.
- Use of the vortex plays an important role in the DLLME procedure.
- No disperser solvent was added for enhancing the phase separation.
- Extractant solvent volume was investigated in blank and real samples.
- Effects of the sale and the alcohol content were studied for optimize the protocol.

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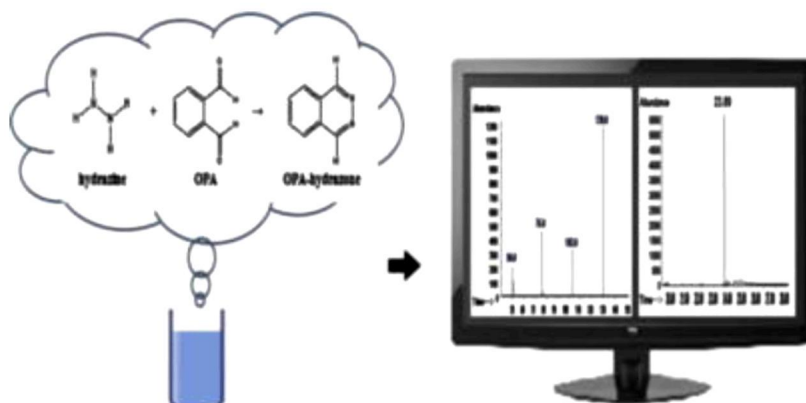
Sensitive determination of hydrazine in water by gas chromatography-mass spectrometry after derivatization with *ortho*-phthalaldehyde

Original Research Article

Pages 79-83

Jin-Aa Oh, Ju-Hyun Park, Ho-Sang Shin

Graphical abstract



Highlights

► New derivatization method of hydrazine with *ortho*-phthalaldehyde in water. ► A simple, rapid and sensitive method by GC–MS. ► The reaction conditions were optimized. ► Very small amount of sample and solvent is needed.

Mass Spectrometry

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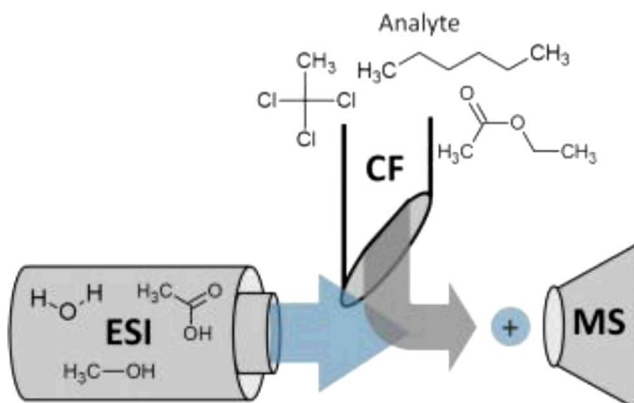
Continuous flow-extractive desorption electrospray ionization: Analysis from “non-electrospray ionization-friendly” solvents and related mechanism

Original Research Article

Pages 84-90

Li Li, Samuel H. Yang, Karel Lemr, Vladimir Havlicek, Kevin A. Schug

Graphical abstract



Highlights

► We demonstrate a technique for ambient spray ionization from nonpolar solvents. ► The technique is mechanistically distinct from extractive electrospray ionization. ► Factorial design experiments, among others, elaborate mechanistic details. ► CF-EDESI expands the application base of conventional ESI.

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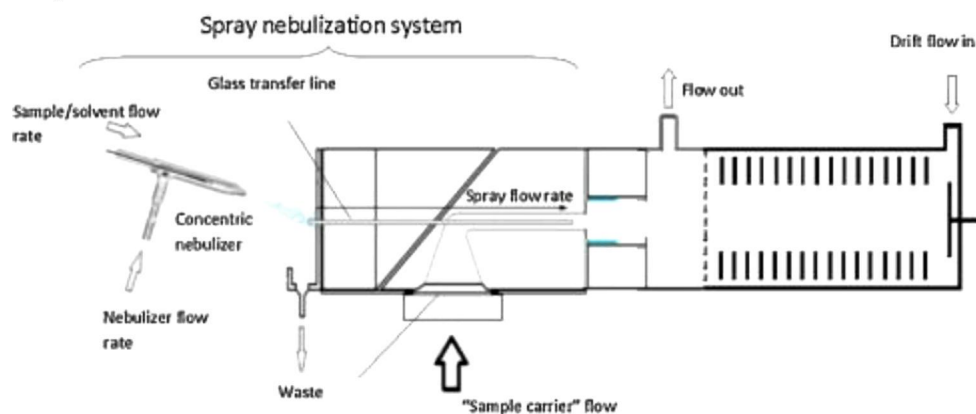
Spray nebulization for sample introduction in ion mobility spectrometry

Original Research Article

Pages 91-99

S. Armenta, A. González, M. Blanco

Graphical abstract



Highlights

- We have developed a spray nebulization introduction system (SIS) for IMS.
- The system used a concentric nebulizer and a temperature controlled transfer line.
- Qualitative and quantitative capabilities were evaluated.
- The SIS is useful for direct analysis of drugs in biological samples.

Sensors and Bioselective Reagents

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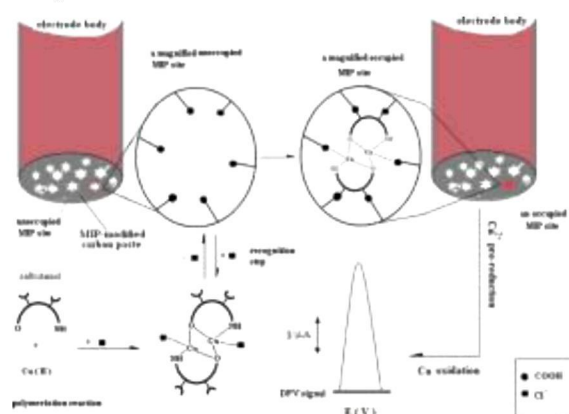
Synthesis of Cu²⁺-mediated nano-sized salbutamol-imprinted polymer and its use for indirect recognition of ultra-trace levels of salbutamol

Original Research Article

Pages 100-107

Taher Alizadeh, Leyla Abolghasemi Fard

Graphical abstract



Highlights

► Nano-sized MIP was prepared by using salbutamol–Cu²⁺ complex as template. ► Carbon paste electrode was modified with the MIP and used as salbutamol sensor. ► Voltammetric signal of participant Cu²⁺ was utilized for salbutamol determination. ► Ultra-trace level detection limit was obtained for salbutamol determination. ► The MIP was also employed for separation of salbutamol from biological samples.

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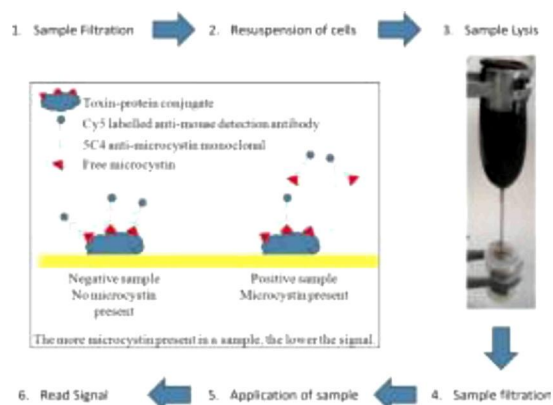
Next generation planar waveguide detection of microcystins in freshwater and cyanobacterial extracts, utilising a novel lysis method for portable sample preparation and analysis

Original Research Article

Pages 108-113

Shauna Devlin, Julie P. Meneely, Brett Greer, Charles Greef, Michael J. Lochhead, Christopher T. Elliott

Graphical abstract



Highlights

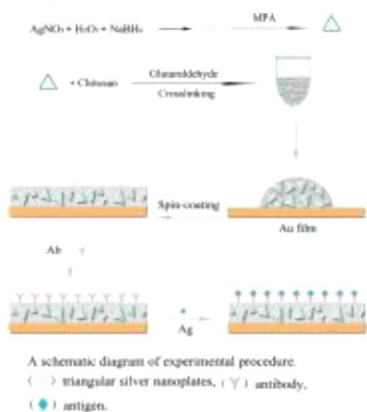
► Sensitive assay for the detection of the most common and toxic microcystin variants. ► Detection of free and cell bound microcystin for a true reflection of toxin content. ► Novel, highly effective lysis method enabling fast and portable disruption of cells. ► Validated to measure microcystins below 1 and 0.1 ng mL⁻¹; free and intracellular. ► Next generation planar waveguide biosensor combining quantification and ease of use.

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Preparation and application of triangular silver nanoplates/chitosan composite in surface plasmon resonance biosensing

Original Research Article

Graphical abstract



Highlights

- ▶ Triangular silver nanoplates were prepared and used to amplify the SPR signal.
- ▶ Triangular silver nanoplates are preserved by MPA and chitosan polymer.
- ▶ The proposed substrate immobilizes antibodies directly without modification.
- ▶ The LOQ of present method for analyte is 32 times lower than that based on Au film.

Separation Methods

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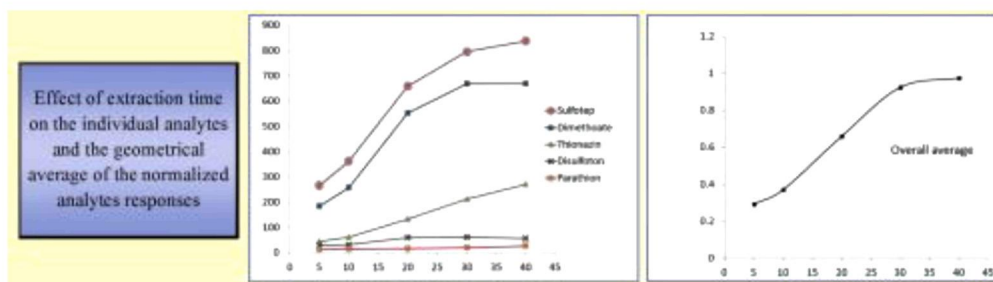
Ultrasonic assisted headspace single drop micro-extraction and gas chromatography with nitrogen-phosphorus detector for determination of organophosphorus pesticides in soil

Original Research Article

Pages 121-126

Amir Salemi, Reihaneh Rasoolzadeh, Massumeh Mohebbi Nejad, Maryam Vosough

Graphical abstract



Highlights

▶ A 2 g portion of soil sample was enough for trace analysis of OPPs at ng g^{-1} level. ▶ Despite low volatility, OPPs could be headspace extracted under mild conditions. ▶ Ultrasonic agitation showed to provide better results than magnetic stirring.