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PT J

AU Morjan, M
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AF Morjan, Martin
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Cammann, Karl

TI Contributions to a reliable hydrogen sensor based on surface plasmon surface resonance spectroscopy

SO SURFACE SCIENCE

LA English

DT Article

DE Sensors; Surface plasmon techniques; Palladium; Hydrogen detection

ID COMPLETE ABSORPTION; THIN-FILMS; LIGHT; REFLECTION; EXCITATION; ALLOY

AB Hydrogen is being seen as a potentially inexhaustible, clean power supply. Direct hydrogen production and storage techniques that would eliminate carbon by-products and compete in cost are accelerated in R&D due to the recent sharp price increase of crude oil. But hydrogen is also linked with certain risks of use, namely the danger of explosions if mixed with air due to the very low energy needed for ignition and the possibility to diminish the ozone layer by undetected leaks. To reduce those risks efficient, sensitive and very early warning systems are needed. This paper will contribute to this challenge in adopting the optical method of Surface-Plasmon-Resonance (SPR) Spectroscopy for a sensitive detection of hydrogen concentrations well below the lower explosion limit. The technique of SPR performed with fiberoptics would in principle allow a remote control without any electrical contacts in the potential explosion zone. A thin palladium metal layer has been studied as sensing element. A simulation programme to find an optimum sensor design lead to the conclusion that an Otto-configuration is more advantageous under intended "real world" measurement conditions than a Kretschmarm configuration. This could be experimentally verified. The very small air gap in the Otto-configuration could be successfully replaced by a several hundred nm thick intermediate layer of MgF(2) or SiO(2) to ease the fabrication of hydrogen sensor-chips based on glass slide substrates. It could be demonstrated that by a separate detection of the TM- and TE-polarized light fractions the TE-polarized beam could be used as a reference signal, since the TE-part does not excite surface plasmons and thus is not influenced by the presence of hydrogen. Choosing the measured TM/TE intensity ratio as the analytical signal a sensor-chip made from a BK7 glass slide with a 425 nm thick intermediate layer Of SiO(2) and a sensing layer of 50 nm Pd on top allowed a drift-free, reliable and reversible determination of hydrogen concentrations up to about 10 vol.% in dry or humid air with a

detection limit of 0.04 vol.% with response times of around 2 min. (C) 2009 Elsevier B.V.
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BENSEN DK, P 1998 US DOE HYDR P, P24508
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*DCH TECHN, FIB OPT HYDR SENS, P24508

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WC Chemistry, Physical; Physics, Condensed Matter

SC Chemistry; Physics

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ER

PT J

AU Peter, C

Brunen-Nieweler, C

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Borchers, T

- AF Peter, C
Brunen-Nieweler, C
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Borchers, T
- TI Differentiation of animal species in food by oligonucleotide microarray hybridization
- SO EUROPEAN FOOD RESEARCH AND TECHNOLOGY
- LA English
- DT Article
- DE species differentiation; cytochrome b; polymerase chain reaction; DNA chip; hybridization; meat; cheese
- ID POLYMERASE-CHAIN-REACTION; CYTOCHROME-B GENE; MITOCHONDRIAL-DNA; PCR-RFLP; MEAT-PRODUCTS; IDENTIFICATION; AMPLIFICATION; SAMPLES; MILK; VALIDATION
- AB Oligonucleotide microarray hybridization analysis of polymerase chain reaction (PCR) products from the mitochondrial cytochrome b gene DNA was applied to identify different animal species in meat and cheese food samples. A pair of universal primers binding to conserved regions of the vertebrate mitochondrial cytochrome b gene was used to amplify a 377 bp fragment with internal regions of high inter-species variability. PCR products of cattle, pig, chicken, turkey, sheep and goat were unequivocally identified by hybridization with species-specific probe sequences immobilized on an oligonucleotide microarray. In meat samples, 0.1% admixtures of beef or chicken meat were still detectable. By using this new PCR-based DNA chip hybridization for the analysis of 24 commercial food samples from routine control, the simultaneous species composition of mixtures with up to four different species could be determined in a single experiment. The results agreed well with those from the reference methods performed at the local food control authority, which are a combination of enzyme-linked immunosorbent assay (ELISA), species-specific PCR and PCR-RFLP (restriction fragment length polymorphism). Thus, the DNA chip hybridization analysis of cytochrome b PCR products offers a new way for rapid and sensitive species differentiation in food.
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TC 11

Z9 13

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J9 EUR FOOD RES TECHNOL
JI Eur. Food Res. Technol.
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PG 8
WC Food Science & Technology
SC Food Science & Technology
GA 845RJ
UT WOS:000223261700014
ER

PT J
AU Cammann, K
AF Cammann, K
TI Sensors and analytical chemistry - Sensitivity versus quality
SO PHYSICAL CHEMISTRY CHEMICAL PHYSICS
LA English
DT Article; Proceedings Paper
CT Annual Meeting of the Deutsche-Bunsen-Gesellschaft-fur-Physikalische-Chemie
CY MAY 29-31, 2003
CL KIEL, GERMANY
SP Deutsch Bunsen Gesell Phys Chem

AB Instrumental analytical chemistry and chemical sensors, especially biosensors have made remarkable progress in the last decade. With respect to the analytical chemical performance characteristics the sensitivities could be increased drastically. However, the very important comparability of trace and ultra-trace analytical data produced in different laboratories has not been improved to the same degree. The analytical chemical performance characteristics of chemical and biochemical sensors must be judged with those facts in mind when they are validated using such traditional instrumental reference methods. Biosensors based on immune-chemical principles are more versatile in allowing nearly every analyte to be determined and are therefore chosen for this progress report. A recently developed calibration free optical single-use "immuno-chip" is described. This low-cost chip is based on an evanescent field fluorescence detection. The same technique can also be used for a real-time recording of DNA hybridisation and dissociation events. Multi-analyte devices and DNA-arrays based on this technological platform were developed using a fast kinetic evaluation method. This offers certain advantages to methods detecting only the endpoint of a molecular association reaction especially concerning the detection of mismatches (SNP detection). Finally, a novel and relatively simple micro-electrochemical method based on a microelectrode array in combination with receptor-functionalized magnetic latex beads and an indicating redox system is described which bears in it an alternative to atomic force microscope binding forces measurements. Depending on the number of individually addressable microelectrodes this method allows the simultaneous study of several hundred to thousands of molecule-molecule interactions within seconds. In addition, a single molecule detection and nearly unlimited multi-analyte, ultra-trace immuno-chemical sensing capabilities seem possible.

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PETER C, THESIS U MUENSTER

NR 13

TC 5

Z9 5

PU ROYAL SOC CHEMISTRY

PI CAMBRIDGE

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JI Phys. Chem. Chem. Phys.

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VL 5

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DI 10.1039/b309894

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WC Chemistry, Physical; Physics, Atomic, Molecular & Chemical

SC Chemistry; Physics

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ER

PT J

AU Breer, C

Engel, U

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AF Breer, C

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TI Enclosed inductively coupled plasma: Spatially resolved profiles of rotational temperatures
and analyte atom distribution

SO APPLIED SPECTROSCOPY

LA English

DT Article

DE enclosed inductively coupled plasma (EICP); rotational temperature; plasma diagnostics; spatial resolution; OH band

ID HIGH-EFFICIENCY NEBULIZER; FOURIER-TRANSFORM SPECTROMETRY; RADIAL EXCITATION TEMPERATURES; MASS-SPECTROMETRY; EMISSION-SPECTROSCOPY; 900 NM; ARGON; CHLORINE; DISCHARGES; CHROMIUM

AB In order to investigate evaporation and desolvation capacities of the enclosed inductively coupled plasma discharge, rotational temperatures (which are commonly considered a good approximation of the heavy particle temperature or gas temperature) were determined as a function of their spatial distribution and their dependence on physical parameters such as gas flows (80-740 mL/min), moisture load, etc. The procedure utilizes the fine structure of the (A₂)Sigma (+) --> (XIII)-I-2 OH band having its band head at 306.4 nm. The rotational temperatures were obtained from the slopes of their Boltzmann plots. Spatial resolution and simultaneous line detection was possible by using a charge-coupled device (CCD) camera in the focal plane of the removed exit slit of a Czerny-Turner monochromator. An interactive data language (EDL) program was developed to calculate the temperature distribution from the received CCD images. Results of the measurement show that the rotational temperatures are between 3750 and 4350 K. They further show the M-shaped spatial profile of analyte intensities and temperature. In the examined gas flow range (80-740 mL/min) the dependence on absolute gas flows and moisture load (5 mg/L) is negligible.

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BREER C, 1999 WINT C PLASM SP

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PU SOC APPLIED SPECTROSCOPY

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J9 APPL SPECTROSC

JI Appl. Spectrosc.

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WC Instruments & Instrumentation; Spectroscopy
SC Instruments & Instrumentation; Spectroscopy
GA 494UQ
UT WOS:000172304600005
ER

PT J
AU Twiehaus, T
Evers, S
Buscher, W
Cammann, K
AF Twiehaus, T
Evers, S
Buscher, W
Cammann, K
TI Development of an element-selective monitoring system for adsorbable organic halogens (AOX) with plasma emission spectrometric detection for quasi-continuous waste-water analysis
SO FRESENIUS JOURNAL OF ANALYTICAL CHEMISTRY
LA English
DT Article
AB An automated quasi-continuously-operating monitor has been developed for element-selective analysis of adsorbable organic halogens (AOX) in water. After extensive optimization the automatic method was applied to the analysis of standard solutions and real waste water samples to prove its analytical applicability.
The new instrument is based on the element-selective analysis of halogens by means of a spectroscopic detection system consisting of a microwave-induced helium plasma excitation source (TM010-type; developed in this laboratory) and the plasma emission detector (PED) which operates with oscillating narrow-band interference filters. After enriching the organic components on activated charcoal and pyrolysis in an oxygen stream at 950 degreesC, in accordance with DIN/EN 38409,H14/1485, interfering CO₂ and H₂O gas generated during combustion is removed from the analytes in the so-called ELSA-system (element-selective AOX-analyzer). For focused injection into the plasma excitation source the analytes (hydrogen halides) are trapped in a deactivated fused silica capillary at -180 degreesC; this is followed by identification and quantification on the basis of element-specific emission of radiation in the VIS and NIR-region (chlorine 837.6

nm, fluorine 685.6 nm).

Bromine and iodine could not be detected with satisfactory inter-element selectivity, because of spectral interferences caused by matrix elements, and so results from the respective single-element investigations for determination of AOB_r and AOI are not presented. The procedure has been validated and the analytical performance has been examined by calibration with p-chlorophenol and p-fluorophenol. The limit of detection was 1.1 µg (absolute) for chlorine and 6.6 µg (absolute) for fluorine.

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TC 6

Z9 6

PU SPRINGER-VERLAG
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J9 FRESEN J ANAL CHEM
JI Fresenius J. Anal. Chem.
PD NOV
PY 2001
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BP 614
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PG 7
WC Chemistry, Analytical
SC Chemistry
GA 498KK
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ER

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AU Trebbe, U
Niggemann, M
Cammann, K
Fiaccabrino, GC
Koudelka-Hep, M
Dzyadevich, S
Shulga, O
AF Trebbe, U
Niggemann, M
Cammann, K
Fiaccabrino, GC
Koudelka-Hep, M
Dzyadevich, S
Shulga, O
TI A new calcium-sensor based on ion-selective conductometric microsensors - membranes and features
SO FRESENIUS JOURNAL OF ANALYTICAL CHEMISTRY

LA English

DT Article

ID NEUTRAL IONOPHORES; ELECTRODE; FABRICATION; MAGNESIUM; OPTODES; DESIGN

AB Based on the concept of ion-selective conductometric microsensors (ISCOM) a new calcium sensor was developed and characterized. ISCOM have a single probe, all-solid-state construction and do not need a reference electrode. These sensors are amenable to miniaturization and integration in the true sense of integrated circuit and microsystem technologies. The detection is accomplished by measurement of the bulk conductance $G(m)$ of a thin polymeric membrane containing an ion-complexing agent, where the magnitude of $G(m)$ can be related to the content of the primary ion in the analyzed solution. Thin-film platinum electrodes forming an interdigitated electrode are used as the transducer to detect the conductivity of the polymeric membrane. Optimization of the membrane composition was carried out by testing different types of calcium-ionophores, polymers, and plasticizers. The sensor characteristics have been investigated. The limit of detection is about $10(7) \text{ mol L}^{-1}$. The dynamic range is $10(-6)-10(1) \text{ mol L}^{-1}$ with a response time of less than 5 s. These parameters are comparable to those of corresponding potentiometric calcium selective electrodes (ISE). The Ca^{2+} -ISCOM demonstrates good practical relevant selectivities against typical interfering ions for biomedical and environmental applications.

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NR 19

TC 13

Z9 14

PU SPRINGER-VERLAG

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J9 FRESEN J ANAL CHEM

JI Fresenius J. Anal. Chem.

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WC Chemistry, Analytical

SC Chemistry

GA 498KL

UT WOS:000172508700007

ER

PT J

AU Peter, C

Meusel, M

Grawe, F

Katerkamp, A

Cammann, K

Borchers, T

AF Peter, C

Meusel, M

Grawe, F

Katerkamp, A

Cammann, K

Borchers, T

TI Optical DNA-sensor chip for real-time detection of hybridization events

SO FRESENIUS JOURNAL OF ANALYTICAL CHEMISTRY

LA English

DT Article

ID SURFACE-PLASMON RESONANCE; EVANESCENT-WAVE BIOSENSOR; POLYMERASE-CHAIN-REACTION; MEDICAL DIAGNOSTICS; PCR PRODUCTS; TECHNOLOGY; GENE; OLIGONUCLEOTIDES; BIOANALYSIS; GENOSENSOR

AB An optical sensor system based on evanescent field excitation of fluorophore-labeled DNA-targets specifically binding to immobilized DNA probes has been developed, thus enabling for real-time analysis of hybridization events. Oligonucleotide probes are directly immobilized on the surface of the disposable sensor chip via biotin/neutravidin linkage and hybridize to complementary Cy5-labeled target DNA in the sample; this is recorded as an increase in the fluorescence signal. Under optimized conditions the hybridization rate was constant and directly proportional to the target concentration. When an 18mer oligonucleotide was used as a probe a linear calibration curve was obtained for a 56mer single-stranded DNA target derived from the neomycin phosphotransferase gene, a selection marker in a variety of genetically modified plants, with an estimated lower limit of detection of 0.21 nmol L⁻¹. No cross-hybridization to a 51 mer actin DNA target was observed and even a single-nucleotide mismatch led to a negligible signal. A shutter in the readout device enabled separate detection of targets hybridizing to probes immobilized at the inlet and outlet sides, respectively, of the flow channel. This opens a route toward a real-time DNA array format with analysis times as short as 1-2 min. As a realistic sample a Cy5-labeled 56 bp PCR product was measured after separation of the double-stranded DNA by simple heat denaturation with a detection limit clearly lower than that of traditional gel electrophoresis.

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NR 39

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Z9 28

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J9 FRESEN J ANAL CHEM

JI Fresenius J. Anal. Chem.

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PG 8
WC Chemistry, Analytical
SC Chemistry
GA 483UX
UT WOS:000171655200006
ER

PT J
AU Eikermann, D
Borchardt, M
Cammann, K
Knoll, M
Wendzinski, F
AF Eikermann, D
Borchardt, M
Cammann, K
Knoll, M
Wendzinski, F
TI Densitometric analysis for quality control in poly(vinyl chloride)-membrane electrode manufacturing
SO ANALYTICA CHIMICA ACTA
LA English
DT Article
DE quality control; pigment; ion-selective polymer membrane; light reflection measurement; densitometer
ID ION-SELECTIVE ELECTRODES; AMMONIUM; SENSORS; MEMBRANES; BIOSENSOR; ANALYZERS

AB This paper describes a simple densitometric method which will enable high quality potentiometric ion-selective electrodes (ISEs) to be produced. When assembling double matrix membrane (DMM) technology electrodes, it is critical that the membrane is located for the electrode to function properly. It is, therefore, important that this is monitored during the production process. The membrane must be able to come into contact with the relevant substance to be analysed but it is also important that there is no leakage between the solution and the sensor conductor path. The poly(vinyl chloride)- (PVC) membrane material is inserted into sensor configuration. All manufactured sensors need to be checked so that there is no leakage in the membrane. After the PVC is inserted, it is necessary to perform a densitometric measurement to check that the correct amount of PVC is presented and that it is evenly distributed. A pigment is added to the PVC to enable this to occur. The pigment ensures that part of the light spectrum emitted by the densitometer is absorbed. The reflected light is then analysed to identify both the quantity and location of the PVC. We found that adding a pigment to the PVC-membrane surrounding ammonium-selective electrodes does not change the electrodes electrochemical characteristics. (C) 2001 Elsevier Science B.V. All rights reserved.

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TC 1

Z9 1
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PI AMSTERDAM
PA PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS
SN 0003-2670
J9 ANAL CHIM ACTA
JI Anal. Chim. Acta
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BP 139
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DI 10.1016/S0003-2670(01)00891-1
PG 8
WC Chemistry, Analytical
SC Chemistry
GA 440JW
UT WOS:000169173000015
ER

PT J
AU Patel, NG
Meier, S
Cammann, K
Chemnitius, GC
AF Patel, NG
Meier, S
Cammann, K
Chemnitius, GC
TI Screen-printed biosensors using different alcohol oxidases
SO SENSORS AND ACTUATORS B-CHEMICAL
LA English
DT Article
DE ethanol; enzyme sensor; alcohol oxidase; screen-printing; wine analysis

ID COLUMN LIQUID-CHROMATOGRAPHY; AMPEROMETRIC BIOSENSOR; ETHANOL; ELECTRODES; DEHYDROGENASE; SYSTEMS; FERMENTATION; CALIBRATION; BEVERAGES; GLUCOSE

AB Low-cost screen-printed sensors consisting of a platinum working electrode, a carbon counter electrode, and an Ag/AgCl pseudo-reference electrode were fabricated for the development of alcohol oxidase biosensors. The sensors were fabricated as amperometric transducers for the detection of alcohols in batch systems. A mixture of alcohol oxidase (AOD) with poly(carbamoyl)sulfonate (PCS) hydrogel was used for enzyme immobilization onto the platinum electrodes. Alcohol oxidases from different sources such as from *Hansenula sp.*, from *Candida boidinii* and from *Pichia pastoris* were used for immobilization. The performances of the resulting different sensors has been compared and characterized with respect to enzyme load, pH and temperature dependence, response time, recovery time, linear range and sensitivity. The relative response of sensors for different alcohols was measured to evaluate the selectivity of the sensors. The effect of ascorbic acid and sodium sulfite as electrochemical interferents on the sensor's performance was investigated. The continuous operation and storage stability of the sensors were also evaluated. Most of the characterization parameters were found to be superior for sensors with immobilized AOD from *Hansenula sp.* The sensors were also tested with wine samples. The results obtained by the newly developed biosensors were compared to results obtained by pycnometry, the well-established reference method as well as gas chromatography method. (C) 2001 Elsevier Science B.V. All rights reserved.

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NR 40

TC 48

Z9 51

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J9 SENSOR ACTUAT B-CHEM

JI Sens. Actuator B-Chem.

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VL 75

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EP 110

DI 10.1016/S0925-4005(01)00545-7

PG 10

WC Chemistry, Analytical; Electrochemistry; Instruments & Instrumentation

SC Chemistry; Electrochemistry; Instruments & Instrumentation

GA 427JN

UT WOS:000168401200017

ER

PT J

AU Cammann, K
Kleibohmer, W

AF Cammann, K
Kleibohmer, W

TI Quality in (analytical) R&D - ideas for the next step after EURACHEM/CITAC Guide 2

SO ACCREDITATION AND QUALITY ASSURANCE

LA English

DT Editorial Material

DE EURACHEM/CITAC Guide 2; quality assurance in research and development analytical results; quality management

AB The EURACHEM/CITAC Guide 2 is an important step towards the establishment of a quality assurance system in analytical research and development. But it is only the first step because it focuses on the metrological characteristics. In addition to Guide 2 there should be a supplementary guide providing assistance for effective and quality-orientated management of research groups.

C1 Univ Munster, Inst Chem & Biochem Sensor Res, D-48149 Munster, Germany.

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CR Cammann K, 1998, ACCREDIT QUAL ASSUR, V3, P403
*EURACHEM CITAC, 1998, EURACHEM CITAC GUID, V2

NR 2

TC 2

Z9 2

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J9 ACCREDIT QUAL ASSUR

JI Accredit. Qual. Assur.

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PY 2001

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BP 72

EP 73

DI 10.1007/PL00010441

PG 2

WC Chemistry, Analytical; Instruments & Instrumentation

SC Chemistry; Instruments & Instrumentation

GA 402PM

UT WOS:000166997400006

ER

PT J

AU Henn, D
Cammann, K

AF Henn, D
Cammann, K

TI Voltammetric ion-selective electrodes (VISE)

SO ELECTROANALYSIS

LA English

DT Article

DE voltammetric ion-selective electrodes (VISE); one-shot screen-printed VISE for potassium and lead

ID ELECTROCHEMICAL POLARIZATION PHENOMENA; INTERFACE; PROGRESS

AB Voltammetric ion-selective electrodes (VISE) based on a traditional principle with internal electrolyte as well as solid-state devices in the form of electrochemical one-shot teststrip are developed. In the latter the interfering polarization at the solid-state backside contact can be avoided by increasing the contact area and thus decreasing the current density at this interface drastically as compared to the interface ISE-membrane/sample. The chemically modified electrodes described here will hopefully replace the highly toxic mercury electrodes used in stripping analysis. In the development of highly reproducible screen-printed VISE, controlling the area of the active membrane surface is much easier. Therefore, it is possible to produce many VISE with absolutely identical features opening the route to precalibrated devices without any need for additional recalibration by the end user.

C1 Univ Munster, Inst Chem & Biochem Sensor Res, D-48149 Munster, Germany.

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NR 21

TC 5

Z9 5

PU WILEY-V C H VERLAG GMBH

PI BERLIN

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J9 ELECTROANAL

JI Electroanalysis

PD NOV

PY 2000

VL 12

IS 16

BP 1263

EP 1271

DI 10.1002/1521-4109(200011)12:16<1263::AID-ELAN1263>3.0.CO;2-B

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WC Chemistry, Analytical; Electrochemistry

SC Chemistry; Electrochemistry

GA 372WH

UT WOS:000165256700004

ER

PT J

AU Starp, H
Buschmann, N
Cammann, K

AF Starp, H
Buschmann, N
Cammann, K

TI Novel teststrip with increased accuracy

SO FRESENIUS JOURNAL OF ANALYTICAL CHEMISTRY

LA English

DT Article

AB A new type of a simple and cheap teststrip for liquid samples is described. It is based on microchromatography or microtitration on a porous, capillary-active substrate (e.g., filter paper or a similar absorbent material). In case of microchromatography an analyte-selective indicator (and other auxiliary reagents) is impregnated or immobilized on the capillary-active substrate; in case of micro-titration the capillary-active substrate contains a titrant which reacts stoichiometrically with the analyte. Quantitative analysis is performed by measurement of an area (which had changed its color) rather than by evaluation of the shade or intensity of a color (like in conventional teststrips). In order to show the broad applicability of this new principle teststrips for different analytes like Quaternary Ammonium Compounds (QACs), the cation Ni^{2+} , the anion SO_4^{2-} and H_2O_2 are described. The detection limit and working range of the novel teststrip can be adjusted by variation of its size.

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SONNTAG O, 1988, TROCKENCHEMIE ANAL T

NR 6

TC 2

Z9 2

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PI NEW YORK

PA 175 FIFTH AVE, NEW YORK, NY 10010 USA

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J9 FRESEN J ANAL CHEM

JI Fresenius J. Anal. Chem.

PD SEP-OCT

PY 2000

VL 368

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BP 203

EP 207

DI 10.1007/s002160000393

PG 5

WC Chemistry, Analytical

SC Chemistry

GA 357QB

UT WOS:000089511400013

ER

PT J

AU Patel, NG

Elenkotter, A

Camman, K

Chemnitius, GC

AF Patel, NG

Elenkotter, A

Camman, K

Chemnitius, GC

TI Fabrication and characterization of disposable type lactate oxidase sensors for dairy products and clinical analysis

SO SENSORS AND ACTUATORS B-CHEMICAL

LA English

DT Article

DE biosensors; amperometry; enzyme electrode; lactate; Nafion

ID SCREEN-PRINTED SENSORS; FLOW-INJECTION ANALYSIS; SOLUBLE L-LACTATE; ENZYME ELECTRODES; GLUCOSE; BIOSENSOR; FILM; IMMOBILIZATION; GLUTAMATE; BLOOD

AB Disposable transducers having a working electrode made of a polymer disk sputter-coated with platinum, a screen-printed graphite basal track and an aluminum foil as a contact pad were fabricated for the development of L-lactate oxidase biosensors. Uncoated electrodes were characterized by cyclic voltammetry. A mixture of lactate oxidase with polyethyleneimine (PEI) and poly(carbamoyl)sulphonate (PCS) hydrogel was used for enzyme immobilization onto the platinum disk of the transducers. A two-electrode configuration set up in an amperometric mode was used to measure the current generated due to the enzymatically generated hydrogen peroxide. The sensors capable of sensitive L-lactate determination were fabricated with different settings of Nafion(R) layers to exclude electroactive interferents. Lactate oxidase sensors were characterized with respect to linear range, sensitivity, response time and recovery time. The effects of ascorbic acid and temperature on the sensor performance were investigated. The continuous operation and the stability of sensors were also evaluated. The performance of sensors coated with larger numbers of small amounts of Nafion(R)

was found to be more advantageous than that of sensors coated with fewer numbers of larger amounts of Nafion(R). The sensors were also tested with diluted dairy products and human whole blood and serum. Good agreement was found between the results obtained by the newly developed disposable sensors and other well established analytical methods. (C) 2000 Elsevier Science S.A. All rights reserved.

C1 Inst Chemo & Biosensorik, D-48149 Munster, Germany.

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PA PO BOX 564, 1001 LAUSANNE, SWITZERLAND
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J9 SENSOR ACTUAT B-CHEM
JI Sens. Actuator B-Chem.
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VL 67
IS 1-2
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EP 141
DI 10.1016/S0925-4005(00)00410-X
PG 8
WC Chemistry, Analytical; Electrochemistry; Instruments & Instrumentation
SC Chemistry; Electrochemistry; Instruments & Instrumentation
GA 340UH
UT WOS:000088553000017
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PT J
AU Cammann, K
Kleibohmer, W
AF Cammann, K
Kleibohmer, W
TI Quality management in analytical chemical R&D
SO ACCREDITATION AND QUALITY ASSURANCE
LA English
DT Editorial Material
C1 Inst Chemo & Biosensor EV, D-48149 Munster, Germany.
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J9 ACCREDIT QUAL ASSUR

JI Accred. Qual. Assur.

PD JAN

PY 2000

VL 5

IS 1

BP 1

EP 2

PG 2

WC Chemistry, Analytical; Instruments & Instrumentation

SC Chemistry; Instruments & Instrumentation

GA 277MN

UT WOS:000084937500002

ER

PT J

AU Freitag, H
Huth-Fehre, T
Cammann, K

AF Freitag, H
Huth-Fehre, T
Cammann, K

TI Rapid identification of plastics from electronic devices with NIR-spectroscopy

SO ANALYTICAL LETTERS

LA English

DT Article

DE NIR-spectroscopy; online identification; plastic recycling; classification; principal component analysis; cluster analysis

AB In this study, a NIR-based identification system for recycling purposes of plastics from electronic devices has been constructed and tested with 91 typical samples, such as computer housings. The system consisted of a robust NIR-monochromator with a fast InGaAs-diode array detector, a conventional halogen lamp as light source and a standard PC for signal processing. Spectra have been collected in the wavelength range between 800 and 1700 nm. Chemometric data analysis with appropriate data preprocessing (smoothing differentiation) led to the desired distinction of the different plastic types. It was shown, that the presented system has, due to its speed, the potential of being applied to high throughput recycling streams.

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*MATHW INC, 1994, MATLAB HIGH PERF NUM

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NR 11

TC 2

Z9 2

PU MARCEL DEKKER INC

PI NEW YORK

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SN 0003-2719

J9 ANAL LETT

JI Anal. Lett.

PY 2000

VL 33

IS 7

BP 1425

EP 1431

DI 10.1080/00032710008543132

PG 7

WC Chemistry, Analytical

SC Chemistry

GA 315UR

UT WOS:000087131800016

ER

PT J

AU Schult, K
Katerkamp, A
Trau, D
Grawe, F
Cammann, K
Meusel, M

AF Schult, K
Katerkamp, A
Trau, D
Grawe, F
Cammann, K
Meusel, M

TI Disposable optical sensor chip for medical diagnostics: New ways in bioanalysis

SO ANALYTICAL CHEMISTRY

LA English

DT Article

ID HUMAN CHORIONIC-GONADOTROPIN; IMMUNOASSAY; BIOSENSORS; ASSAY;
IMMUNOSENSORS; SYSTEM; BLOOD

AB An optical sensor system is described which is particularly well suited for medical point-of-care diagnostics. The system allows for all kinds of immunochemical assay formats and consists of a disposable sensor chip and an optical readout device. The chip is built up from a ground and cover plate with in- and outlet and, between, of an adhesive film with a capillary aperture of 50 μ m. The ground plate serves as a solid phase for the immobilization of biocomponents, In the readout device, an evanescent field is generated at the surface of the ground plate by total internal reflection of a laser beam. This field is used for the excitation of fluorophor markers. The generated fluorescence light is detected by a simple optical setup using a photomultiplier tube. Because of the evanescent field excitation, washing or separation steps can be avoided. With this system the pregnancy hormone chorionic gonadotropin (hCG) could be determined in human serum with a detection limit of 1 ng/mL, Recovery values were 86, 106, and 102% for 5,

50, and 100 ng/mL hCG, respectively. The SD in repeated measurements (n = 10) was 5.6%. Furthermore, the feasibility of the system in competitive-type immunoassays was demonstrated for serum theophylline. A linear calibration curve of signal vs theophylline between 1 and 50 mg/L was obtained. Recovery values varied between 118% (10 mg/L) and 81.0% (20 mg/L).

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NR 24

TC 60

Z9 60

PU AMER CHEMICAL SOC

PI WASHINGTON

PA 1155 16TH ST, NW, WASHINGTON, DC 20036 USA

SN 0003-2700

J9 ANAL CHEM
JI Anal. Chem.
PD DEC 1
PY 1999
VL 71
IS 23
BP 5430
EP 5435
DI 10.1021/ac9907686
PG 6
WC Chemistry, Analytical
SC Chemistry
GA 260YW
UT WOS:000083981900033
ER

PT J
AU Wiegand, K
Trapp, T
Cammann, K
AF Wiegand, K
Trapp, T
Cammann, K
TI Development of a dissolved carbon dioxide sensor based on a coulometric titration
SO SENSORS AND ACTUATORS B-CHEMICAL
LA English
DT Article; Proceedings Paper
CT 12th European Conference on Solid-State Transducers - 9th UK Conference on Sensors
and Their Applications
CY SEP 13-16, 1998
CL SOUTHAMPTON, ENGLAND
DE dissolved carbon dioxide; coulometric titration; seawater; iridium oxide

AB This paper presents a sensor for the determination of dissolved carbon dioxide in water and seawater, respectively. The gas diffuses through a hydrophobic gas-permeable membrane and reacts with an alkaline electrolyte causing a pH-value shift which is detected by an iridium oxide pH-electrode. The duration of the pH-shift within a specified pH-interval is measured and this so-called measuring period is correlated with the partial pressure of dissolved carbon dioxide in the sample. To start a new cycle, the initial pH-value is reached again by generating hydroxide ions electrochemically. The sensor allows determination of dissolved carbon dioxide in water in the range from 30 to 180 ppm. (C) 1999 Elsevier Science S.A. All rights reserved.

C1 Inst Chemo & Biosensor eV ICB, D-48149 Munster, Germany.

RP Wiegand, K (reprint author), Inst Chemo & Biosensor eV ICB, Mendelstr 7, D-48149 Munster, Germany

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*DTSCH I NORM EV, 1979, 38409 DIN, P1
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NR 13

TC 8

Z9 8

PU ELSEVIER SCIENCE SA

PI LAUSANNE

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SN 0925-4005

J9 SENSOR ACTUAT B-CHEM

JI Sens. Actuator B-Chem.

PD SEP 7

PY 1999

VL 57

IS 1-3

BP 120

EP 124

DI 10.1016/S0925-4005(99)00063-5

PG 5

WC Chemistry, Analytical; Electrochemistry; Instruments & Instrumentation

SC Chemistry; Electrochemistry; Instruments & Instrumentation

GA 253RY

UT WOS:000083570600017

ER

PT J

AU Lepkojus, F
Watanabe, N
Buscher, W
Cammann, K
Bohm, G

AF Lepkojus, F
Watanabe, N
Buscher, W
Cammann, K
Bohm, G

TI A simple radiofrequency helium discharge plasma (RFP) for spectroscopic purposes

SO JOURNAL OF ANALYTICAL ATOMIC SPECTROMETRY

LA English

DT Article; Proceedings Paper

CT European Winter Conference on Plasma Spectrochemistry

CY JAN 10-15, 1999

CL PAU, FRANCE

AB In this work a radiofrequency powered helium discharge plasma (RFP) for optical or mass spectrometry purposes was developed and investigated. Research focussed on the spectroscopic properties of the RFP, and its suitability as an alternative excitation source for plasma spectroscopy was proved. Halogenated organic compounds were injected into the gas flow to detect fluorine, chlorine, bromine and iodine at their most intense spectral lines resolved from interferences. With this plasma, the detection of Cl down to 125 ng without background correction is possible. Injection of air samples causes few interferences and shows the robustness of the radiofrequency plasma against large sample volumes of up to 500 μ L. A Cl selectivity against N-2, O-2 (both more than 5000:1) and C (250:1) is achieved without background correction. A fluorine quantification is possible for 0.25 μ g only. I and Br detection also can be achieved down to 0.25 μ g without any background correction.

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NR 4
TC 5
Z9 5
PU ROYAL SOC CHEMISTRY
PI CAMBRIDGE
PA THOMAS GRAHAM HOUSE, SCIENCE PARK, MILTON RD,, CAMBRIDGE CB4 0WF, CAMBS, ENGLAND
SN 0267-9477
J9 J ANAL ATOM SPECTROM
JI J. Anal. At. Spectrom.
PD SEP
PY 1999
VL 14
IS 9
BP 1511
EP 1513
DI 10.1039/a901634a
PG 3
WC Chemistry, Analytical; Spectroscopy
SC Chemistry; Spectroscopy
GA 244YG
UT WOS:000083077900034
ER

PT J

- AU Smirnova, AL
Levitchev, SS
Khitrova, VL
Grekovich, AL
Vlasov, YG
Schwake, A
Cammann, K
- AF Smirnova, AL
Levitchev, SS
Khitrova, VL
Grekovich, AL
Vlasov, YG
Schwake, A
Cammann, K
- TI Effect of simultaneous existence of two ion-exchangers with opposite charges of lipophilic groups
- SO ELECTROANALYSIS
- LA English
- DT Article; Proceedings Paper
- CT International Symposium on Electrochemical and Biosensors (Matrafured 98)
- CY OCT 14-17, 1998
- CL MATRAFURED, HUNGARY
- DE ion-selective electrodes; magnesium; calcium; ionophores; lipophilic additives
- ID SELECTIVE CHEMICAL SENSORS; NEUTRAL-CARRIER; POLYMERIC MEMBRANES; SENSING COMPONENT; ETHER COMPOUNDS; ELECTRODES; ADDITIVES; IONOPHORES
- AB The effect of simultaneous existence in PVC membrane of both anion- and cation-exchanger taken in optimal molar ratio is shown for cation-selective membranes containing calcium (ETH 129, ETH 5234) and magnesium (ETH 5214, ETH 4030) ionophores. The presence of cation- as well as anion-exchanger is preferable for improvement of membrane selectivity. Potentiometric properties for calcium and magnesium selective membranes containing both ion-exchangers are compared to the results obtained by impedance spectroscopic method.
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- RP Smirnova, AL (reprint author), St Petersburg State Univ, Univ Skii Pr 2, RUS-198904 St Petersburg, Russia

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NR 31

TC 6

Z9 6

PU WILEY-V C H VERLAG GMBH

PI BERLIN

PA MUHLENSTRASSE 33-34, D-13187 BERLIN, GERMANY

SN 1040-0397

J9 ELECTROANAL

JI Electroanalysis

PD JUL
PY 1999
VL 11
IS 10-11
BP 763
EP 769
DI 10.1002/(SICI)1521-4109(199907)11:10/11<763::AID-ELAN763>3.0.CO;2-W
PG 7
WC Chemistry, Analytical; Electrochemistry
SC Chemistry; Electrochemistry
GA 226MU
UT WOS:000082024400015
ER

PT J
AU Schwake, A
Cammann, K
Smirnova, AL
Levitchev, SS
Khitrova, VL
Grekovich, AL
Vlasov, YG
AF Schwake, A
Cammann, K
Smirnova, AL
Levitchev, SS
Khitrova, VL
Grekovich, AL
Vlasov, YG
TI Potentiometric properties and impedance spectroscopic data of poly(vinyl chloride) membranes containing quaternary ammonium salts of different chemical structure
SO ANALYTICA CHIMICA ACTA
LA English
DT Article; Proceedings Paper
CT 10th European Conference on Analytical Chemistry, Euroanalysis 10
CY SEP 06-11, 1998
CL BASEL, SWITZERLAND

- SP Chem Fed European Chem Soc, New Swiss Chem Soc, Sect Analytic Chem
- DE ion-selective electrode; quaternary ammonium salt; bionic potential; electrochemical impedance spectroscopy; specific membrane bulk resistance
- ID SELECTIVE ELECTRODES; PVC MEMBRANES; ION
- AB The influence of the chemical structure of symmetrical and asymmetrical quaternary ammonium salts (QASs) on the potentiometric and impedance spectroscopic data of ion-selective poly(vinyl chloride) membranes plasticized with 2-nitrophenyl octyl ether (NPOE) and bis(2-ethylhexyl) sebacate (DOS) was investigated. It was found that the properties of the QAS, e.g. solubility in the membrane phase and, thus, the difference in the degree of association, influences the membrane characteristics. An increasing number of carbon atoms in symmetrical QASs diminishes the interference of lipophilic anions and enlarges the sensitivity to basic ones. The choice of plasticizer is important for the membrane properties as well, e.g. the influence of lipophilic ions is smaller for DOS membranes in comparison to NPOE ones. Results are discussed from the viewpoint of the difference in free enthalpy of hydration and basic properties of the anions. Additionally, the bulk properties of the membranes in dependence of QAS structure were studied by electrochemical impedance spectroscopy. The magnitude of the specific bulk resistance is governed by the dielectric properties of the plasticizer. Nevertheless, it is shown that QAS structure determines the long-term development of the bulk resistance. (C) 1999 Elsevier Science B.V. All rights reserved.
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St Petersburg State Univ, St Petersburg 198904, Russia.
- RP Schwake, A (reprint author), Inst Chemo & Biosensor eV, ICB, Mendelstr 7, D-48149 Munster, Germany
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NR 28

TC 16

Z9 16

PU ELSEVIER SCIENCE BV

PI AMSTERDAM

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SN 0003-2670

J9 ANAL CHIM ACTA

JI Anal. Chim. Acta

PD JUN 30

PY 1999

VL 393

IS 1-3

BP 19

EP 28

DI 10.1016/S0003-2670(99)00336-0

PG 10

WC Chemistry, Analytical

SC Chemistry

GA 220QZ

UT WOS:000081680100004

ER

PT J

AU Schwake, A
Cammann, K
Smirnova, AL
Levitchev, SS
Khitrova, VL
Grekovich, AL
Vlasov, YG

AF Schwake, A
Cammann, K
Smirnova, AL
Levitchev, SS
Khitrova, VL
Grekovich, AL
Vlasov, YG

TI The influence of an anionic additive on the properties of cation-exchanger based calcium-selective electrodes

SO FRESENIUS JOURNAL OF ANALYTICAL CHEMISTRY

LA English

DT Article

ID FLOW-INJECTION POTENTIOMETRY; PVC MEMBRANES; IMPEDANCE METHODS; SOLVENT PROPERTIES; ION-EXCHANGER; IONOPHORES; VALINOMYCIN; TRANSPORT; MATRIX; K⁺

AB Potentiometric and electrochemical impedance spectroscopic investigations of calcium-selective membranes containing poly(vinylchloride), dioctylphenylphosphonate, calcium (bis[4-(1,1,3,3-tetramethylbutyl)phenyl] phosphate) and different amounts of the lipophilic anionic additive tridodecylmethylammonium chloride were carried out. The addition of the lipophilic additive changes the properties of calcium-selective electrodes, e. g. slope and calcium selectivity. The selectivity for calcium in presence of H⁺, Na⁺, K⁺, NH₄⁺, Mg²⁺, Ba²⁺, Sr²⁺ and (C₂H₅)₄N⁺ was measured by three different methods, namely separate solution method, fixed interference method and matched potential method. Membranes with different concentration ratios between the calcium-exchanger and tridodecylmethylammonium chloride were investigated within half a year. The tendency of changing from cationic into anionic response for membranes containing nearly equivalent concentrations of cation- and anion-exchanger was shown. This inversion of the electrode response depends not only upon the concentration ratio of both ion-exchangers but also upon the total concentration of calcium-exchanger. Electrochemical impedance spectroscopy was used for monitoring the development of membrane resistances during a soaking period of one month. Based on these results dielectric constants for the calcium-selective membranes depending on the membrane composition were determined. Furthermore, the dependence of the membrane resistance on the membrane thickness and the concentration of tridodecylmethylammonium chloride

was evaluated.

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BRAND MJD, 1969, ANAL CHEM, V41, P1185

NR 43

TC 3

Z9 3

PU SPRINGER VERLAG

PI NEW YORK

PA 175 FIFTH AVE, NEW YORK, NY 10010 USA

SN 0937-0633

J9 FRESEN J ANAL CHEM

JI Fresenius J. Anal. Chem.

PD FEB

PY 1999

VL 363

IS 4

BP 369

EP 375

DI 10.1007/s002160051205

PG 7

WC Chemistry, Analytical

SC Chemistry

GA 171ZR

UT WOS:000078895300008

ER

PT J

AU Reinbold, J

 Cammann, K

 Weber, E

 Hens, T

 Reutel, C

AF Reinbold, J
Cammann, K
Weber, E
Hens, T
Reutel, C

TI Roof-shaped clathrate compounds as novel coating materials for the detection of organic solvent vapours: A study focused on thickness shear mode resonators as mass-sensitive transducers

SO JOURNAL FUR PRAKTISCHE CHEMIE-CHEMIKER-ZEITUNG

LA English

DT Article

DE mass-sensitive device; thickness shear mode resonator; sensitive coatings; inclusion compounds; molecular recognition; organic solvent vapour detection

ID ACOUSTIC-WAVE SENSORS; INCLUSION-COMPOUNDS; CHEMICAL SENSORS; VAPORS; RECOGNITION; RESPONSES; SORPTION; POLYMERS; HOST

AB The performance of new crystalline inclusion hosts as chemical sensitive coatings for the detection of organic solvent vapours was investigated by using 10 MHz thickness shear mode resonators as mass-sensitive transducers. The crystalline host compounds under study consist of a characteristic 9,10-dihydro-9,10-ethanoanthracene framework with appended diarylmethanol clathratogenic groups 1, 2 or an analogous subunit 3. Relating to the selectivity of inclusion formation a database was generated consisting of the calibrated sensor responses from nine substituted versions of this host to each of seven organic solvent vapours (and humidity). From molecular shape, polarity and lipophilicity preferred inclusion selectivity was found for alcohol vapours, in particular for ethanol and methanol, thus indicating the predominant role of hydrogen bonding interaction. The inclusion of guest molecules with higher molar volumes was frequently accompanied by slow inclusion rate and sensor response, respectively. By decreasing the host size a general decrease of the sensor sensitivities were observed, but the selectivity (sensitivity pattern) is shifted to smaller molecules, and inclusion is widely controlled by kinetic parameters. By time-dependent data acquisition improved selectivity for analyte molecules with fast inclusion kinetics was obtained, especially for methanol vapours. Moreover, the long-time stability of the coatings was evaluated showing excellent (mass) stability, even over a period of more than two years.

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NR 30

TC 10

Z9 10

PU WILEY-V C H VERLAG GMBH

PI BERLIN

PA MUHLENSTRASSE 33-34, D-13187 BERLIN, GERMANY

SN 0941-1216

J9 J PRAK CHEM-CHEM ZTG

JI J. Prakt. Chem.-Chem. Ztg.

PY 1999

VL 341

IS 3

BP 252

EP 263

DI 10.1002/(SICI)1521-3897(199904)341:3<252::AID-PRAC252>3.0.CO;2-R

PG 12

WC Chemistry, Applied; Chemistry, Multidisciplinary

SC Chemistry

GA 188YJ

UT WOS:000079876700008

ER

PT J

AU Eggenstein, C
Borchardt, M
Diekmann, C
Grundig, B
Dumschat, C
Cammann, K
Knoll, M
Spener, F

AF Eggenstein, C
Borchardt, M
Diekmann, C
Grundig, B
Dumschat, C
Cammann, K
Knoll, M
Spener, F

TI A disposable biosensor for urea determination in blood based on an ammonium-sensitive transducer

SO BIOSENSORS & BIOELECTRONICS

LA English

DT Article

DE disposable biosensor; disposable reference electrode; potentiometric biosensor; urea biosensor; blood urea

ID ELECTRODE; SENSOR; SERUM

- AB A potentiometric urea-sensitive biosensor using a NH_4^+ -sensitive disposable electrode in double matrix membrane (DMM) technology as transducer is described. The ion-sensitive polymer matrix membrane was formed in the presence of an additional electrochemical inert filter paper matrix to improve the reproducibility in sensor production. The electrodes were prepared from one-side silver-coating filter paper, which is encapsulated for insulation by a heat-sealing film. A defined volume of the NH_4^+ -sensitive polymer matrix membrane cocktail was deposited on this filter paper. To obtain the urea-biosensor a layer of urease was cast onto the ion-sensitive membrane. Poly (carbamoysulfonate) hydrogel, produced from a hydrophilic polyurethane prepolymer blocked with bisulfite, served as immobilisation material. The disposable urea-sensitive electrode was combined with a disposable Ag/AgCl reference electrode to obtain the disposable urea biosensor. The sensor responded rapidly and in a stable manner to changes in urea concentrations between 7.2×10^{-5} and 2.1×10^{-2} mol/l. The detection limit was 2×10^{-5} mol/l urea and the slope in the linear range 52 mV/decade. By taking into consideration the influence of the interfering K^+ - and Na^+ - ions the sensor can be used for the determination of urea in human blood and serum samples (diluted or undiluted). A good correlation was found with the data obtained by the spectrophotometric routine method. (C) 1999 Elsevier Science S.A. All rights reserved.
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- RP Spener, F (reprint author), Inst Chemo & Biosensorik Munster, Mendelstr 7, D-48149 Munster, Germany
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NR 28

TC 41

Z9 43

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J9 BIOSENS BIOELECTRON

JI Biosens. Bioelectron.

PD JAN 1

PY 1999

VL 14

IS 1

BP 33

EP 41

DI 10.1016/S0956-5663(98)00103-1

PG 9

WC Biophysics; Biotechnology & Applied Microbiology; Chemistry, Analytical;
Electrochemistry; Nanoscience & Nanotechnology

SC Biophysics; Biotechnology & Applied Microbiology; Chemistry; Electrochemistry; Science &
Technology - Other Topics

GA 160JP

UT WOS:000078227100005

ER

PT J

AU Chemnitius, G
Erlenkotter, A
Frebel, H
Loechel, C
Meier, S
Olschewski, H
Roder, Y
Schneider, J
Cammann, K

AF Chemnitius, G
Erlenkotter, A
Frebel, H
Loechel, C
Meier, S
Olschewski, H
Roder, Y
Schneider, J
Cammann, K

TI Disposable enzyme sensors for food analysis and clinical chemistry

SO QUIMICA ANALITICA

LA English

DT Article; Proceedings Paper

CT 1st Ibero-American Congress on Sensors and Biosensors (IBERSENSOR 98)

CY NOV 09-13, 1998

CL HAVANA, CUBA

SP Inst Mat Reactivos, Fac Phys, Ctr Invest Microelectron, Ctr Estudios Aplicados Desarroll
Energ Nucl, Inst Cibernet, Ctr Ultrason, Matemat Fis

HO UNIV HAVANA

DE enzyme sensor; screen printing; immobilization; membrane

AB Enzyme sensors using various oxidases and oxidase based coupled enzyme sequences for the detection of glucose, sucrose, lactose, lactate, creatinine, creatine, amino acids and biogenic amines are presented. These sensors are based on flexible, low cost and disposable transducers either of the laminated type or the screen printed type. The enzymes are immobilized onto a Pt-working electrode by entrapment in a hydrophilic hydrogel. Most of the basic enzyme sensors show sensitivities of 1 nA/ μ M analyte. In real samples effects of electrochemically interfering substances on the sensor signals have been minimized by applying an anti-interference layer. The linear range of the sensors has been shifted to higher concentrations by using additional diffusion limiting membranes.

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NR 5

TC 0

Z9 0

PU ELSEVIER INFORMACION PROFESIONAL, S A

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J9 QUIM ANAL

JI Quim. Anal.

PY 1999

VL 18

SU 1

BP 147

EP 148

PG 2

WC Chemistry, Analytical

SC Chemistry

GA 328CZ

UT WOS:000087832400047

ER

PT J

AU Kroger, D

Katerkamp, A

Renneberg, R

Cammann, K

AF Kroger, D

Katerkamp, A

Renneberg, R

Cammann, K

TI Surface investigations on the development of a direct optical immunosensor

SO BIOSENSORS & BIOELECTRONICS

LA English

DT Article; Proceedings Paper

CT 5th World Congress on Biosensors

CY JUN 03-05, 1998

CL BERLIN, GERMANY

DE surface activation; immobilisation; grating coupler; immunosensor; fatty acid binding protein; myocardial infarction

ID GRATING COUPLERS; IMMOBILIZATION; LIGANDS

AB In the present paper surface studies for the development of a direct optical immunosensor for fast diagnosis of a myocardial infarction are presented. A fatty acid binding protein was detected by monoclonal antibodies. The applied measuring system was the grating coupler BIOS-1. Based on commercially available transducer materials protein immobilisation techniques have been developed and characterised by TOF-SIMS, AFM and EM. Three different label-free assay types were investigated. Only one assay leads to a sensitive and regenerable sensor set-up. It was possible to detect concentrations of the fatty acid binding protein down to 330 ng/ml. The general applicability of a direct optical immunosensor in the field of myocardial infarction diagnosis was demonstrated by this. (C) 1998 Elsevier Science S.A. All rights reserved.

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NR 15
TC 10
Z9 11
PU ELSEVIER ADVANCED TECHNOLOGY
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J9 BIOSENS BIOELECTRON
JI Biosens. Bioelectron.
PD NOV 1
PY 1998
VL 13
IS 10
BP 1141
EP 1147
DI 10.1016/S0956-5663(98)00068-2
PG 7
WC Biophysics; Biotechnology & Applied Microbiology; Chemistry, Analytical;
Electrochemistry; Nanoscience & Nanotechnology
SC Biophysics; Biotechnology & Applied Microbiology; Chemistry; Electrochemistry; Science &
Technology - Other Topics
GA 139NJ
UT WOS:000077035200011
ER

PT J
AU Schwake, A
Geuking, H
Cammann, K
AF Schwake, A
Geuking, H
Cammann, K
TI Application of a new graphical fitting approach for data analysis in electrochemical
impedance spectroscopy
SO ELECTROANALYSIS

LA English

DT Article

DE electrochemical impedance spectroscopy; data analysis; fitting method; CNLS method; ion-selective membranes

ID ION SELECTIVE ELECTRODES; PVC MEMBRANES; LEAST-SQUARES; POWER

AB A new graphical method for analyzing impedance data presented in the complex plane plot is introduced. The advantage of our approach is that it can be employed easily with commonly available spreadsheet calculation software like Microsoft Excel, beneficial when no CNLS software is available.

A semicircle in the complex plane plot is defined by three points of the circumference. Knowing the trigonometric function, the radius, e.g., representing the bulk resistance of ion-selective membranes, can be calculated easily. The error of the data fit is determined by considering the standard deviation of the data points referred to the fitted semicircle. The capacitance of the system under investigation can be calculated by plotting the real part of the impedance against the angular frequency. If the equivalent circuit is known it is possible to obtain the value of the capacitor by employing the nonlinear least square method. The applicability and efficiency of our method has been verified by analyzing networks and impedance spectra of ion-selective polymer matrix membranes. The results of our method were compared with those obtained by applying the CNLS method.

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NR 18

TC 4
Z9 4
PU WILEY-V C H VERLAG GMBH
PI BERLIN
PA MUHLENSTRASSE 33-34, D-13187 BERLIN, GERMANY
SN 1040-0397
J9 ELECTROANAL
JI Electroanalysis
PD NOV
PY 1998
VL 10
IS 15
BP 1026
EP 1029
DI 10.1002/(SICI)1521-4109(199810)10:15<1026::AID-ELAN1026>3.0.CO;2-H
PG 4
WC Chemistry, Analytical; Electrochemistry
SC Chemistry; Electrochemistry
GA 148XT
UT WOS:000077560100005
ER

PT J
AU Cammann, K
Kleibohmer, W
AF Cammann, K
Kleibohmer, W
TI Need for quality management in research and development
SO ACCREDITATION AND QUALITY ASSURANCE
LA English
DT Article
DE quality management; research; development; scientific fraud

AB There is growing interest in setting up a general concept for quality management and quality control in research and development, which in this case means, for example, research in the fields of medicine and social sciences. This article is a strong plea for a quality management system in all fields of research and development and will probably initiate broad discussion on this delicate topic.

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*OECD, 1992, ENV MON, V45
*EN, 1989, 45001 EN

NR 7

TC 9

Z9 11

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J9 ACCREDIT QUAL ASSUR

JI Accred. Qual. Assur.

PD OCT

PY 1998

VL 3

IS 10

BP 403

EP 405

DI 10.1007/s007690050273

PG 3

WC Chemistry, Analytical; Instruments & Instrumentation

SC Chemistry; Instruments & Instrumentation

GA 129FL

UT WOS:000076453100005

ER

PT J

AU Meusel, M
Trau, D
Katerkamp, A
Meier, F
Polzius, R
Cammann, K

AF Meusel, M
Trau, D
Katerkamp, A
Meier, F
Polzius, R
Cammann, K

TI New ways in bioanalysis - one-way optical sensor chip for environmental analysis

SO SENSORS AND ACTUATORS B-CHEMICAL

LA English

DT Article; Proceedings Paper

CT 4th European Conference on Optical Chemical Sensors and Biosensors

CY MAR 29-APR 01, 1998

CL MUNSTER, GERMANY

DE optical immunosensor; fluorescence label; evanescent wave; environmental analysis; 2,4-dichlorophenoxyacetic acid

ID 2,4-DICHLOROPHENOXYACETIC ACID; PESTICIDE-RESIDUES; BIOSENSORS; WATER; SYSTEM

AB An optical immunosensor system consisting of a disposable low-cost sensor chip including a fluidic system and a base unit for optical readout was developed. Near infrared (NIR)-fluorescence markers (Cy5) were excited by an evanescent wave generated on the surface of the sensor chip. The combination of both fluorescence measurements and evanescent wave excitation provides extremely sensitive detection and avoids any washing or separation steps. To demonstrate the feasibility of the system for environmental control assays for the determination of the herbicide 2,4-dichlorophenoxyacetic acid (2,4-D) were developed. Two different assay formats were applied to determine 2,4-D in the relevant concentration range. Due to the assay formats chosen a direct proportional relationship between analyte concentration and signal intensity was achieved. Within an assay time of 15 min only, the analyte 2,4-D could be determined in a linear concentration range covering three orders of magnitude. (C) 1998 Elsevier Science S.A. All rights reserved.

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CR Kramer PM, 1997, ANAL CHIM ACTA, V347, P187
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KATERKAMP A, P EUR, V4, P131

NR 18

TC 19

Z9 19

PU ELSEVIER SCIENCE SA

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J9 SENSOR ACTUAT B-CHEM

JI Sens. Actuator B-Chem.

PD AUG 31

PY 1998

VL 51

IS 1-3

BP 249

EP 255

DI 10.1016/S0925-4005(98)00202-0

PG 7

WC Chemistry, Analytical; Electrochemistry; Instruments & Instrumentation

SC Chemistry; Electrochemistry; Instruments & Instrumentation

GA 156WD

UT WOS:000078024400037

ER

PT J

AU Cammann, K

AF Cammann, K

TI Opt(r)ode quo vadis?

SO SENSORS AND ACTUATORS B-CHEMICAL

LA English

DT Editorial Material

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NR 0

TC 1

Z9 1

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J9 SENSOR ACTUAT B-CHEM

J1 Sens. Actuator B-Chem.

PD AUG 31

PY 1998

VL 51

IS 1-3

BP 1

EP 4

PG 4

WC Chemistry, Analytical; Electrochemistry; Instruments & Instrumentation

SC Chemistry; Electrochemistry; Instruments & Instrumentation

GA 156WD

UT WOS:000078024400001

ER

PT J

AU Julicher, P
Haalck, L
Meusel, M
Cammann, K
Spener, F

AF Julicher, P
Haalck, L
Meusel, M
Cammann, K
Spener, F

TI In situ antigen immobilisation for stable organic-phase immunoelectrodes

SO ANALYTICAL CHEMISTRY

LA English

DT Article

ID 2,4-DICHLOROPHENOXYACETIC ACID; ANTIBODIES; SOLVENTS; BINDING;
MICROORGANISMS; ELECTRODES; BIOSENSORS; PROTEINS

AB A new method based on enzymatic single-step in situ synthesis of hapten-carrier conjugates on electrodes is described yielding stable, reproducible, and reusable organic-phase immunoelectrodes (OPIEs). The electrodes developed were tailored for analyte detection in organic solvents and allow for the analysis of soil extracts without further sample processing and cleanup. Catalyzed by transglutaminase from a variant of *Streptovorticillium mobaraense*, the reaction proceeds in aqueous solution with and without addition of organic media in only 1.5 hours. In this study, the herbicide 2,4-dichlorophenoxyacetic acid (2,4-D) was chosen as model compound and chemically amino functionalized prior to its enzymatic immobilization. The high reproducibility of the immobilization procedure allowed for batch calibration of the immunoelectrodes. Moreover, pure methanol or treatment with diluted sulfuric acid used for regeneration studies did not disturb the hapten layer. The OPIE consists of screen-printed carbon electrodes, monoclonal anti-2,4-D antibodies, and the immunochemical recognition reaction and was optimized with regard to a high stability in organic media. For electrochemical detection, horseradish peroxidase was used as enzyme label together with H₂O₂ as substrate and hexacyanoferrate(II)/(III) as mediator. The OPIE showed high stability upon storage over 93 days. Response times of 17 s (t₉₅) were found to be advantageous compared to those of other biosensors. Including the immunochemical reactions, the complete assay takes 30 min. A calibration curve for 2,4-D in 30% methanol/buffer obtained with 70 electrodes within 4 weeks revealed a detection limit of 9 mg/L, a sensitivity of 1.3 nA L mg⁽⁻¹⁾ cm⁽⁻²⁾, and a repeatability of 6.8%. Although we calculated a lowered repeatability for reused electrodes of 13.4% and a slightly decreased sensitivity of 0.9 nA L mg⁽⁻¹⁾ cm⁽⁻²⁾, multiple-used OPIEs could also be

applied for calibration.

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- NR 26
TC 10
Z9 10
PU AMER CHEMICAL SOC
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PA 1155 16TH ST, NW, WASHINGTON, DC 20036 USA
SN 0003-2700

J9 ANAL CHEM

JI Anal. Chem.

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PG 6

WC Chemistry, Analytical

SC Chemistry

GA 111AF

UT WOS:000075414600004

ER

PT J

AU Trapp, T

Ross, B

Cammann, K

Schirmer, E

Berthold, C

AF Trapp, T

Ross, B

Cammann, K

Schirmer, E

Berthold, C

TI Development of a coulometric CO₂ gas sensor

SO SENSORS AND ACTUATORS B-CHEMICAL

LA English

DT Article; Proceedings Paper

CT EUROSENSORS XI Meeting

CY SEP 21-24, 1997

CL WARSAW, POLAND

DE carbon dioxide; gas sensor; iridium oxide; coulometric titration; potentiometric sensor

ID IRIDIUM; ELECTRODES; DIOXIDE

AB This paper presents a new kind of gas sensor for carbon dioxide (CO₂) based on coulometric titration. CO₂ diffuses through a gas permeable membrane, reacts with an alkaline electrolyte and decreases the pH value. By generating OH⁻ ions electrochemically the initial pH value is reached. The duration of titrating the OH⁻ ions with CO₂ is measured. A thermally prepared or reactively sputtered iridium/iridiumoxide-electrode is used as the pH sensing element. This sensor determines CO₂ in the range of 200-20000 ppm in air and has much advantage over the known Severinghaus sensor. The drift of the pH sensor does not affect the coulometric CO₂ sensor and acidic gases only ineffect the sensor during their presence. Typical results are presented including calibration plots. (C) 1998 Elsevier Science S.A. All rights, reserved.

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NR 14

TC 11

Z9 11

PU ELSEVIER SCIENCE SA

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J9 SENSOR ACTUAT B-CHEM

JI Sens. Actuator B-Chem.

PD JUL 31

PY 1998

VL 50
IS 2
BP 97
EP 103
DI 10.1016/S0925-4005(98)00161-0
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WC Chemistry, Analytical; Electrochemistry; Instruments & Instrumentation
SC Chemistry; Electrochemistry; Instruments & Instrumentation
GA 138GD
UT WOS:000076962800001
ER

PT J
AU Buhlmann, K
Schlatt, B
Cammann, K
Shulga, A
AF Buhlmann, K
Schlatt, B
Cammann, K
Shulga, A
TI Plasticised polymeric electrolytes: new extremely versatile receptor materials for gas sensors (VOC monitoring) and electronic noses (odour identification/discrimination)
SO SENSORS AND ACTUATORS B-CHEMICAL
LA English
DT Article; Proceedings Paper
CT 9th International Conference on Solid-State Sensors and Actuators
CY JUN 16-19, 1997
CL CHICAGO, ILLINOIS
SP IEEE Electron Devices Soc
DE gas sensors; polymeric electrolytes; interdigitated transducers; solvent vapours; sensor arrays
ID POLY(ETHYLENE OXIDE); CONDUCTIVITY; COATINGS; VAPORS; ARRAYS

AB A new class of receptor materials for gas sensors for volatile organic compounds (VOC) was developed: plasticised polymeric electrolytes (PPE). A PPE usually consists of three components: a polymer; a plasticiser; and an organic salt. In an extensive systematic study more than 500 compositions using seven polymers, eight plasticisers and four organic salts were tested in order to investigate the effect of individual components and their ratio on the gas sensing properties (selectivity, sensitivity, etc.) of the PPE. The operation of a PPE-based gas sensor is based on a variation of the bulk ionic conductivity of the receptor layer due to absorption of an ambient vapour. The specific conductance of the used PPE compositions is usually between 0.1 and 10 $\mu\text{S} \times \text{cm}^{-1}$ and it may vary more than 100 times in the dynamic range of the gas sensor, which stretches typically from low ppm up to some 10000 ppm. The PPE-based gas sensors using miniaturised interdigitated transducers demonstrate a remarkable variety of their properties depending on the PPE composition. The performance of single sensors and sensor arrays was thoroughly studied. (C) 1998 Elsevier Science S.A. All rights reserved.

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FENTON DE, 1973, POLYMER, V14, P589

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TC 22

Z9 22

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J9 SENSOR ACTUAT B-CHEM

JI Sens. Actuator B-Chem.

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WC Chemistry, Analytical; Electrochemistry; Instruments & Instrumentation

SC Chemistry; Electrochemistry; Instruments & Instrumentation

GA 115FG

UT WOS:000075652400025

ER

PT J

AU John, H
Cammann, K
Schlegel, W

AF John, H
Cammann, K
Schlegel, W

TI Development and review of radioimmunoassay of 12-S-hydroxyheptadecatrienoic acid

SO PROSTAGLANDINS & OTHER LIPID MEDIATORS

LA English

DT Review

DE 12-S-hydroxyheptadecatrienoic acid; thromboxane A(2); thromboxanesynthase;
radioimmunoassay

ID HIGH-PERFORMANCE LIQUID; HYDROXY FATTY-ACIDS; TIME-RESOLVED
FLUOROIMMUNOASSAY; BOVINE SERUM-ALBUMIN; ARACHIDONIC-ACID; HUMAN-
PLATELETS; THROMBOXANE SYNTHASE; 12-L-HYDROXY-5,8,10-HEPTADECATRIENOIC
ACID; PROSTAGLANDIN ENDOPEROXIDES; CHROMATOGRAPHIC METHOD

AB For more than 25 years 12-S-hydroxyheptadecatrienoic acid (HHT) has been known to be a product of thromboxanesynthase (TX-Syn) when synthesized with thromboxane A₂ (TXA₂). Although there are some hints that HHT has anti-aggregatory effects, to date, it has neither been shown to have any specific pathological relevance nor is there much information about its physiological role. This review presents a summary of the physicochemical properties of HHT, its chemical synthesis, the impact of various biological systems on its enzymatic and non-enzymatic production and its physiological function and metabolization, as well as a survey of the most important methods for analyzing this unsaturated hydroxy-fatty acid. Due to the low antibody-raising potency expected in HHT no immunological system for HHT quantification has been developed so far. In our report we present the development and validation of a sensitive and reliable, competitive radioimmunoassay (RIA) suitable for the quantitative determination of HHT. HHT was produced by an enhanced enzymatic method using platelet-rich plasma (PRP). With an effective and modified liquid-liquid and solid-phase extraction method we were able to produce highly purified HHT (97% purity by GC/MS) in sub-milligram ranges. These fractions were used for the synthesis of BSA-antigen-conjugates and for immunization of rabbits. The tritiated tracer was synthesized using prostaglandin H synthase for the production of prostaglandin H₂ (PGH₂) followed by an aqueous reaction with Fe²⁺-solution to rearrange PGH₂ to HHT. The dynamic range of the assay was from 30-400 pg/tube, with a sensitivity of approximately 40 pg/tube. The evaluation of the assay was performed by a HPLC-RIA method as well as by correlation with a quantitative HPLC method and correlation with TXB₂ concentrations in a blood coagulation study. The assay may be useful for the quantification of HHT in several tissues and body fluids under various physiological conditions and may also help to understand the possible physiological role of HHT in biological processes.

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J9 PROSTAG OTH LIPID M

JI Prostaglandins Other Lipid Mediat.

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PY 1998

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WC Biochemistry & Molecular Biology; Cell Biology

SC Biochemistry & Molecular Biology; Cell Biology

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PT J

AU Orban, M
Katerkamp, A
Renneberg, R
Spener, F
Cammann, K

AF Orban, M
Katerkamp, A
Renneberg, R
Spener, F
Cammann, K

TI Kinetic analysis of immunointeractions with covalently immobilized fatty acid-binding protein using a grating coupler sensor

SO JOURNAL OF IMMUNOLOGICAL METHODS

LA English

DT Article

DE grating coupler sensor; heart fatty acid-binding protein; antigen-antibody interaction; biosensor; kinetic analysis

ID ANTIGEN; ANTIBODIES; SURFACE; RECOGNITION; ADSORPTION; CONSTANTS; COMPLEX

AB Application of a grating coupler sensor (GCS) to the real time investigation of the interaction kinetics of covalently immobilized recombinant bovine heart-type fatty acid-binding protein (H-FABP) and corresponding antibody is described. The immobilization of the antigen is performed by activating the matrix hydroxyl groups with p-toluenesulfonyl chloride (TSC) and afterwards coupling the protein by reaction with its nucleophilic aminogroups. Covalent coupling via TSC permits reproducible measurements of immunointeractions on the same grating coupler sensor chip and complete regeneration after each binding cycle with glycine-hydrochloride. We demonstrate the analysis of binding data obtained on a GCS by linearization as well as direct curve fitting using the integrated rate equation for the determination of apparent rate and affinity constants. With both analysis methods we studied H-FABP/monoclonal anti-H-FABP-antibody interactions and obtained an average apparent association rate constant $k(a) = 4.2 \times 10^3 \text{ M}^{-1} \text{ s}^{-1}$, a dissociation rate constant of $k(d) = 1.3 \times 10^{-4} \text{ s}^{-1}$ and an equilibrium constant of $K-D = 3 \times 10^{-8} \text{ M}$. (C) 1998 Published by Elsevier Science B.V. All rights reserved.

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TC 5

Z9 5

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J9 J IMMUNOL METHODS

JI J. Immunol. Methods

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WC Biochemical Research Methods; Immunology
SC Biochemistry & Molecular Biology; Immunology
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PT J

AU Mroz, A
Borchardt, M
Diekmann, C
Cammann, K
Knoll, M
Dumschat, C

AF Mroz, A
Borchardt, M
Diekmann, C
Cammann, K
Knoll, M
Dumschat, C

TI Disposable reference electrode

SO ANALYST

LA English

DT Article

DE reference electrode; disposable sensors; potentiometry

AB A disposable reference electrode was developed which can be used for environmental and medical analysis, It is an Ag/AgCl electrode with an integrated junction, prepared using inexpensive materials such as glass-fibre filter medium and heat-sealing film with screen printing and encapsulating by lamination. The potential difference between this electrode and a commercial electrode is hardly influenced by concentration changes and pH (3-11) of the analyte solution. The shelf-life and the operational lifetime of the reference electrode were investigated. Applications with disposable ion selective sensors are demonstrated.

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NR 15

TC 19

Z9 19

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JI Analyst

PD JUN

PY 1998

VL 123

IS 6

BP 1373

EP 1376

DI 10.1039/a708992i

PG 4

WC Chemistry, Analytical

SC Chemistry

GA ZU983

UT WOS:000074256300037

ER

PT J

AU Schwake, A
Ross, B
Cammann, K

AF Schwake, A
Ross, B
Cammann, K

TI Basic analysis on the origin of asymmetry potentials observed with ion-selective polymer matrix membranes

SO SENSORS AND ACTUATORS B-CHEMICAL

LA English

DT Article; Proceedings Paper

CT EUROSENSORS XI Meeting

CY SEP 21-24, 1997

CL WARSAW, POLAND

DE anion-selective polymer matrix membrane; asymmetry potential; conditioning time; kinetic theory of ion-selective electrodes; atomic force microscopy

ID SERUM

AB Anion-selective polymer matrix membranes with different ion-exchangers as ionophores, different plasticizers and additives were prepared in order to determine the influence of the membrane composition on the asymmetry potential and the necessary conditioning times of those membranes. The observed temperature effect on the conditioning times was interpreted according to the kinetic theory of ion-selective electrodes. Furthermore the membrane surfaces were investigated with the technique of atomic force microscopy for studying whether the asymmetry potential is caused by topographic differences between both interfaces of a membrane. (C) 1998 Elsevier Science S.A. All rights reserved.

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CR BUCK RP, 1994, PURE APPL CHEM, V66, P2527
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NR 10

TC 2

Z9 2

PU ELSEVIER SCIENCE SA

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SN 0925-4005

J9 SENSOR ACTUAT B-CHEM

JI Sens. Actuator B-Chem.

PD MAY 30

PY 1998

VL 48

IS 1-3

BP 251

EP 257

DI 10.1016/S0925-4005(98)00048-3

PG 7

WC Chemistry, Analytical; Electrochemistry; Instruments & Instrumentation

SC Chemistry; Electrochemistry; Instruments & Instrumentation

GA ZZ473

UT WOS:000074732900001

ER

PT J

- AU Orschel, M
Katerkamp, A
Meusel, M
Cammann, K
- AF Orschel, M
Katerkamp, A
Meusel, M
Cammann, K
- TI Evaluation of several methods to quantify immobilized proteins on gold and silica surfaces
- SO COLLOIDS AND SURFACES B-BIOINTERFACES
- LA English
- DT Article
- DE biotin; gold surface; immobilization proteins; protein quantification; silica surface; streptavidin
- ID BICINCHONINIC ACID; QUANTITATION; ELECTRODES; STABILITY; BINDING; ASSAY
- AB In the present study, the application of several methods for the determination of an immobilized protein are presented and the results discussed. Streptavidin was bound covalently on gold and silica surfaces. A radio assay was used as a reference method for the quantification of the immobilized protein. Two photometric, two fluorescence-spectroscopic methods and an immunochemical approach, based on a sandwich-ELISA (enzyme linked immunosorbent assay) format were applied with regard to their feasibility for sensitive protein quantification. The photometric methods were not sensitive enough, but one of the fluorescence based methods and the ELISA could be applied for the detection of low protein concentrations on the surfaces. (C) 1998 Elsevier Science B.V.
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NR 18

TC 4

Z9 4

PU ELSEVIER SCIENCE BV

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SN 0927-7765

J9 COLLOID SURFACE B

JI Colloid Surf. B-Biointerfaces

PD APR 15

PY 1998

VL 10

IS 5

BP 273

EP 279

DI 10.1016/S0927-7765(98)00008-3

PG 7

WC Biophysics; Chemistry, Physical; Materials Science, Biomaterials

SC Biophysics; Chemistry; Materials Science

GA ZL200

UT WOS:000073408800004

ER

PT J

AU Lehnert, H
Twiehaus, T
Rieping, D
Buscher, W
Cammann, K

AF Lehnert, H
Twiehaus, T
Rieping, D
Buscher, W
Cammann, K

- TI Thermal desorption and atomic emission spectrometric determination of adsorbable organically bound elements for water analysis
- SO ANALYST
- LA English
- DT Article; Proceedings Paper
- CT XXX Colloquium Spectroscopy International
- CY SEP 21-26, 1997
- CL MELBOURNE, AUSTRALIA
- SP GBC Sci Equipment, Hewlett Packard, Perkin Elmer, Spectro Anal Instruments, Varian
- DE activated charcoal; thermal desorption; organically bound halides; organically bound elements; plasma emission detector; microwave-induced plasma
- AB A new analytical method and system has been developed which can be used for the simultaneous determination of adsorbable organically bound elements (AOE) contained in a water sample. This new method of water analysis, by summary detection of substance categories, will significantly extend the existing water parameter for adsorbable organically bound halides (AOX). The organic matter impurities are separated quantitatively along the lines of German standards DIN 38409, H14 through adsorption on activated charcoal. Simultaneous element-specific detection can then be carried out by plasma emission spectrometry. As a special innovation, the new method allows the use of highly sensitive plasma types (e.g., microwave-induced plasma) through thermal desorption of the analyte compounds because no interfering CO₂ is generated. Here other sorbents of the kind needed for other problematic separation processes can also be used. The system is equipped with the possibility of removing gases containing solvent vapours. Compared with the conventional method, the thermal desorption step has no influence on the sensitivity or the precision of the determination of adsorbable organic model substances. The first calibration of the new system resulted in a detection limit of 0.20 µg of chlorine.
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- RP Lehnert, H (reprint author), Univ Munster, Inst Chemo & Biosensor EV, Mendelstr 7, D-48149 Munster, Germany
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*DTSCH EINH WASS A, 1985, 38409H14 DIN DTSCH E
- NR 9

TC 7
Z9 7
PU ROYAL SOC CHEMISTRY
PI CAMBRIDGE
PA THOMAS GRAHAM HOUSE, SCIENCE PARK, MILTON ROAD, CAMBRIDGE CB4 4WF,
CAMBS, ENGLAND
SN 0003-2654
J9 ANALYST
JI Analyst
PD APR
PY 1998
VL 123
IS 4
BP 637
EP 640
DI 10.1039/a707109d
PG 4
WC Chemistry, Analytical
SC Chemistry
GA ZK143
UT WOS:000073289700019
ER

PT J
AU Trost, A
Borchardt, M
Cammann, K
Dumschat, C
AF Trost, A
Borchardt, M
Cammann, K
Dumschat, C
TI Sample preparation system for ion-selective electrodes
SO FRESENIUS JOURNAL OF ANALYTICAL CHEMISTRY
LA English
DT Article; Proceedings Paper

CT ANAKON 97 Conference

CY APR 06-08, 1997

CL CONSTANCE, GERMANY

ID MAGNESIUM; WATER

AB The sample preparation of real world water samples for potentiometric determinations is often time and labor consuming. Therefore sample preparation systems were developed for the determination of water hardness and nitrate concentrations in drinking water and well water. The systems allow the adjustment of the ionic strength and removal of interfering ions. The sample preparation agents required are fixed by using a disposable sample preparation disk. The system was tested by analyzing real water samples and the results were compared to those obtained by using reference methods.

C1 ICB, D-48149 Munster, Germany.

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*FLUKA CHEM, SEL ION ION SEL EL O

NR 12

TC 3

Z9 3

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J9 FRESEN J ANAL CHEM

JI Fresenius J. Anal. Chem.

PD APR

PY 1998

VL 360

IS 7-8

BP 755
EP 758
DI 10.1007/s002160050800
PG 4
WC Chemistry, Analytical
SC Chemistry
GA ZH457
UT WOS:000073112200004
ER

PT J
AU Schwake, A
Ross, B
Cammann, K
AF Schwake, A
Ross, B
Cammann, K
TI Chrono amperometric determination of hydrogen peroxide in swimming pool water using an ultramicroelectrode array
SO SENSORS AND ACTUATORS B-CHEMICAL
LA English
DT Article
DE ultramicroelectrode array; chrono amperometry; hydrogen peroxide; swimming pool water; disinfection; NAFION (TM) membrane
AB Ultramicroelectrode arrays have been applied for monitoring the disinfectant hydrogen peroxide in swimming pool water. The sensors were manufactured using silicon thin-film technology. Each consisted of nine miniaturized platinum working electrodes connected in parallel. A platinum counter electrode and a silver/silver chloride reference electrode completed the measuring setup. The ultramicroelectrode arrays were characterized by cyclic voltammetry and chrono amperometry. The sensor properties could be improved and the interfering influence of the swimming pool water matrix was reduced by covering the working electrodes of the arrays with NAFION(TM) membranes. A comparison of the introduced chrono amperometric method using the ultramicroelectrode array with the German standard method (DIN) for the hydrogen peroxide determination showed that the accuracy of the NAFION(TM) coated sensors is suitable for monitoring and controlling the hydrogen peroxide concentration in swimming pool waters. (C) 1998 Elsevier Science S.A. All rights reserved.
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GUTTORMSON SG

NR 19

TC 24

Z9 24

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J9 SENSOR ACTUAT B-CHEM

JI Sens. Actuator B-Chem.

PD MAR 15

PY 1998

VL 46

IS 3

BP 242

EP 248

DI 10.1016/S0925-4005(98)00124-5

PG 7

WC Chemistry, Analytical; Electrochemistry; Instruments & Instrumentation

SC Chemistry; Electrochemistry; Instruments & Instrumentation

GA ZW047

UT WOS:000074368300013

ER

PT J

AU Stephan, H
Kruger-Rambusch, T
Gloe, K
Hasse, W
Ahlers, B
Cammann, K
Rissanen, K
Brodesser, G
Vogtle, F

AF Stephan, H
Kruger-Rambusch, T
Gloe, K
Hasse, W
Ahlers, B
Cammann, K
Rissanen, K
Brodesser, G
Vogtle, F

TI Homocalixpyridines: Ligands exhibiting high selectivity in extraction and sensor processes

RID B-5688-2008

SO CHEMISTRY-A EUROPEAN JOURNAL

LA English

DT Article

DE homocalixarenes; host-guest chemistry; mercury; molecular modeling; silver

ID LIQUID-LIQUID-EXTRACTION; METAL-IONS; CALIXARENES; MACROCYCLES;
RECOGNITION

- AB A series of differently functionalised all-homocalixpyridines I and their open-chain analogues II were synthesised by use of the Muller-Roscheisen reaction. Their complexation properties were then investigated, by extraction and liquid membrane experiments. This new class of macrocycles composed of pyridine units shows a pronounced selectivity towards soft metal ions, such as Ag-I, Pd-II, Hg-II and Au-III. The complexation behaviour can be easily modified by variation of the ring size and substitution pattern, Molecular modelling studies of the ligands, as well as their silver(I) and mercury(II) complexes, were performed in order to understand the principles of complex formation. Furthermore, the use of the new ligands as ionophores in PVC-based membrane electrodes was studied.
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NR 30

TC 13

Z9 13

PU WILEY-V C H VERLAG GMBH

PI BERLIN

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SN 0947-6539

J9 CHEM-EUR J

JI Chem.-Eur. J.

PD MAR

PY 1998

VL 4

IS 3

BP 434

EP 440

DI 10.1002/(SICI)1521-3765(19980310)4:3<434::AID-CHEM434>3.0.CO;2-W

PG 7

WC Chemistry, Multidisciplinary

SC Chemistry

GA ZF356

UT WOS:000072889300009

ER

PT J

AU Loechel, C
Chemnitius, GC
Borchardt, M
Cammann, K

AF Loechel, C
Chemnitius, GC
Borchardt, M
Cammann, K

- TI Amperometric bi-enzyme based biosensor for the determination of lactose with an extended linear range
- SO ZEITSCHRIFT FUR LEBENSMITTEL-UNTERSUCHUNG UND-FORSCHUNG A-FOOD RESEARCH AND TECHNOLOGY
- LA English
- DT Article
- DE amperometric enzyme sensor; lactose determination; screen printing; extended linear range; diffusion barrier
- ID MILK; PRODUCTS; FOOD
- AB Amperometric biosensors were developed for the determination of lactose using beta-galactosidase and glucose oxidase. The enzymes were co-immobilized under mild conditions in a poly(carbamoyl)sulphonate-hydrogel matrix onto the surface of low-cost-screen-printed platinum working electrodes for the amperometric detection of the enzymatically generated hydrogen peroxide which was monitored at + 600 mV versus Ag/AgCl/3 M KCl. The basic sensors showed linearity over a concentration range of 0.0035-2 mM (correlation coefficient, $r = 0.99992$). They were used in a batch system to determine the lactose content in milk. As sample pre-treatment, only dilution was necessary. Data for the determination of lactose with the enzyme electrodes were compared to those obtained using a soluble enzyme test kit (the Boehringer Mannheim UV method). The linear range of the sensors could be increased by applying additional membranes to the top of the planar sensor surface. Commercially available polycarbonate membranes with reduced pore densities and pore sizes supplied best results when fixed using double-sided tape. As an alternative approach, an extended linear range could also be accomplished by spray-coating the sensor surface using a water-based polymer dispersion.
- C1 Inst Chemo & Biosensor EV, D-48149 Munster, Germany.
- RP Chemnitius, GC (reprint author), Inst Chemo & Biosensor EV, Mendelstr 7, D-48149 Munster, Germany
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97873-2

*INT DAIR FED, 1974, 28A INT DAIR FED

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NR 16

TC 9

Z9 9

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J9 Z LEBENSM UNTERS F A

JI Z Lebensm. Unters. Forsch. A-Food Res. Technol.

PY 1998

VL 207

IS 5

BP 381

EP 385

DI 10.1007/s002170050349

PG 5

WC Food Science & Technology

SC Food Science & Technology

GA 139HW

UT WOS:000077023300007

ER

PT J

AU Brosinger, F

Freimuth, H

Lacher, M

Ehrfeld, W

Gedig, E

Katerkamp, A

Spener, F

Cammann, K

AF Brosinger, F
Freimuth, H
Lacher, M
Ehrfeld, W
Gedig, E
Katerkamp, A
Spener, F
Cammann, K

TI A label-free affinity sensor with compensation of unspecific protein interaction by a highly sensitive integrated optical Mach-Zehnder interferometer on silicon

SO SENSORS AND ACTUATORS B-CHEMICAL

LA English

DT Article; Proceedings Paper

CT EUROSENSORS X Meeting

CY SEP 08-11, 1996

CL LOUVAIN, BELGIUM

DE sensor; silicon; integrated optical Mach-Zehnder interferometer

ID DEVICES

AB An integrated optical Mach-Zehnder interferometer (IO-MZI) on silicon was specially designed and tested for application as an affinity sensor. In order to obtain the necessary sensitivity, an optimisation of the refractive index and the thickness of the waveguiding layer was carried out. Refractive measurements with ethanol/water mixtures show a sensitivity of about one order of magnitude higher than the IO-MZIs previously described. The compensation of unspecific protein interaction in an affinity sensor set-up was demonstrated by using both branches of the IO-MZI. One branch was coated with an antigenic structure and blocked with a protein mixture whereas the other was only blocked. A sample with a high background of serum proteins was applied and only the sample containing the specific antibody gave a measurable signal. (C) 1997 Elsevier Science S.A.

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CR FRANEK M, 1994, J AGR FOOD CHEM, V42, P1369
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WEAST RC, 1980, HDB CHEM PHYSICS, pD236

NR 7
TC 34
Z9 35
PU ELSEVIER SCIENCE SA
PI LAUSANNE
PA PO BOX 564, 1001 LAUSANNE, SWITZERLAND
SN 0925-4005
J9 SENSOR ACTUAT B-CHEM
JI Sens. Actuator B-Chem.
PD OCT
PY 1997
VL 44
IS 1-3
BP 350
EP 355
DI 10.1016/S0925-4005(97)00226-8
PG 6
WC Chemistry, Analytical; Electrochemistry; Instruments & Instrumentation
SC Chemistry; Electrochemistry; Instruments & Instrumentation
GA YU444
UT WOS:000071717900019
ER

PT J
AU Riepe, HG
Erber, D
Bettmer, J
Cammann, K

AF Riepe, HG

Erber, D

Bettmer, J

Cammann, K

TI Screening-method for organotins by elimination of the inorganic tin matrix using a coupling of hydride generation (HG) and transversely heated graphite atomizer-atomic absorption spectrometry (THGA-AAS)

SO FRESENIUS JOURNAL OF ANALYTICAL CHEMISTRY

LA English

DT Article

ID TROUT ONCORHYNCHUS-MYKISS; TRIBUTYLTIN; SPECIATION; TOXICITY

AB A selective detection method for organotin compounds by elimination of the inorganic tin matrix has been worked out using a coupling of the hydride generation technique (HG) with transversely heated graphite atomizer-atomic absorption spectrometry (THGA-AAS). The suppression of the inorganic tin matrix bases on the utilization of kinetic interferences during the hydride generation step avoiding expensive chromatographic separation techniques. For the different organotins this method delivers detection limits in the range 0.9-1.2 μ g/L using a 500 μ l sample loop. In comparison with the fully automated determination system this modification represents an efficient screening-method for the determination of organotin in environmental samples allowing fast and inexpensive monitoring.

RP Riepe, HG (reprint author), INST CHEM & BIOSENSOR EV, MENDELSTR 7, D-48149 MUNSTER, GERMANY

CR Oehlmann J, 1996, FRESEN J ANAL CHEM, V354, P540

RIEPE HG, 1996, THESIS U MUNSTER

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NR 19

TC 9

Z9 10

PU SPRINGER VERLAG

PI NEW YORK

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SN 0937-0633

J9 FRESEN J ANAL CHEM

JI Fresenius J. Anal. Chem.

PD OCT

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IS 3

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PG 5

WC Chemistry, Analytical

SC Chemistry

GA XY436

UT WOS:A1997XY43600006

ER

PT J

AU Trost, A
Kleibohmer, W
Cammann, K

AF Trost, A
Kleibohmer, W
Cammann, K

TI Liquid chromatographic isolation of coplanar PCB congeners on an activated carbon stationary phase

SO FRESENIUS JOURNAL OF ANALYTICAL CHEMISTRY

LA English

DT Article

- ID POROUS GRAPHITIC CARBON; DIBENZO-PARA-DIOXINS; POLYCHLORINATED-BIPHENYLS; MONO-ORTHO; SUBSTITUTED CHLOROBIPHENYLS; COLUMN CHROMATOGRAPHY; ENVIRONMENTAL-SAMPLES; SEPARATION; AROCLORS; SEDIMENT
- AB A rapid and uncomplicated method for the fractionation of PCBs leading to an isolation of the highly toxic non-ortho substituted PCBs is described. The liquid chromatographic separation was achieved on a stationary phase consisting of activated carbon and Celite 545. Using eluents with different polarity, isolation of the non-ortho substituted PCBs in a single fraction was achieved. The fractions were analysed by GC/MS. The method was tested by the determination of non-ortho substituted PCBs in technical mixtures (Aroclor 1254 and Aroclor 1242). The results were compared with those obtained by using an HPLC fractionation on a porous graphitic carbon column. Finally, the micro-column fractionation was used for the determination of non-ortho substituted PCBs in native soil samples.
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NR 29
TC 5
Z9 5
PU SPRINGER VERLAG
PI NEW YORK
PA 175 FIFTH AVE, NEW YORK, NY 10010
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J9 FRESEN J ANAL CHEM
JI Fresenius J. Anal. Chem.
PD OCT
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DI 10.1007/s002160050568
PG 5
WC Chemistry, Analytical
SC Chemistry
GA XY436
UT WOS:A1997XY43600008
ER

PT J
AU Erber, D
Roth, J
Cammann, K
AF Erber, D
Roth, J
Cammann, K
TI Quality assurance system for a decomposition method as demonstrated for the Wickbold
combustion technique
SO ACCREDITATION AND QUALITY ASSURANCE
LA English
DT Article

DE quality assurance; decomposition method; Wickbold combustion technique; uncertainty of results

AB A five-step model for a quality assurance system is developed for an internal quality control check. It includes the quality control of the decomposition method and the detection method as steps belonging together. The Wickbold combustion technique as decomposition method in combination with atomic absorption spectrometry was chosen. The vaporization of the elements mercury, arsenic, lead, antimony and selenium is based on combustion in an oxyhydrogen flame, To check the efficiency of the analytical system, the uncertainty of results was calculated on the basis of the "Guide to the Expression of Uncertainty in Measurement".

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CR *AN METH COMM, 1995, ANALYST, V120, P2303

*EURACHEM, 1995, QUANT UNC AN MEAS WO
1995

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*ISO, 1993, 7870 ISO

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NR 11

TC 0

Z9 0

PU SPRINGER VERLAG

PI NEW YORK

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J9 ACCREDIT QUAL ASSUR

JI Accred. Qual. Assur.

PD OCT

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IS 7
BP 332
EP 337
DI 10.1007/s007690050159
PG 6
WC Chemistry, Analytical; Instruments & Instrumentation
SC Chemistry; Instruments & Instrumentation
GA YX258
UT WOS:000072022200005
ER

PT J
AU Cammann, K
AF Cammann, K
TI EURACHEM/CITAC Working Group on Quality Assurance in Research and Development
and Non-Routine Analysis - Progress report on non-routine analysis guide
SO ACCREDITATION AND QUALITY ASSURANCE
LA English
DT Article
C1 Univ Munster, Inst Chemo & Biosensor, D-48149 Munster, Germany.
RP Cammann, K (reprint author), Univ Munster, Inst Chemo & Biosensor, Mendelstr 7, D-
48149 Munster, Germany
NR 0
TC 0
Z9 0
PU SPRINGER VERLAG
PI NEW YORK
PA 175 FIFTH AVE, NEW YORK, NY 10010 USA
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J9 ACCREDIT QUAL ASSUR
JI Accred. Qual. Assur.
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WC Chemistry, Analytical; Instruments & Instrumentation

SC Chemistry; Instruments & Instrumentation

GA YX258

UT WOS:000072022200007

ER

PT J

AU Erber, D
Cammann, K
Roth, J

AF Erber, D
Cammann, K
Roth, J

TI New universal quartz burner for decomposition of samples by the Wickbold combustion technique in determination of arsenic, antimony, selenium, mercury, and lead

SO JOURNAL OF AOAC INTERNATIONAL

LA English

DT Article

ID GRAPHITE ELECTROTHERMAL ATOMIZER; HYDRIDE

AB A new universal quartz burner for the Wickbold decomposition method is investigated with respect to its fast and efficient decomposition of solid samples for determining volatile trace elements like arsenic, antimony, selenium, mercury, and lead. Decomposition is based on burning samples in an oxyhydrogen flame. The samples are transported into the flame in gaseous form by pyrolyzing the material in an oven heated to 1100 degrees C. During this decomposition step, a nitrogen stream loaded with carbon tetrachloride mobilizes the volatile elements, causing separation from the sample matrix. An effective precombustion in oxygen and a large turbulent flame improve decomposition conditions. Different certified inorganic and organic reference materials are pyrolyzed and combusted, and the combustion products are absorbed in water. Metals found in the absorption solutions are analyzed by flow injection/hydride generation/atomic absorption spectrometry. Data were analyzed by several statistical tests recommended for quality control purposes. The combination of a decomposition and detection method resulted in very low detection limits: 1.4 μg arsenic/kg, 0.8 μg antimony/kg, 1.8 μg mercury/kg, 1.4 μg lead/kg, and 1.6 μg selenium/kg can be detected without an extra enrichment step.

C1 HERAEUS QUARZGLAS GMBH, DIV LAB TECH, D-63801 KLEINOSTHEIM, GERMANY.

RP Erber, D (reprint author), INST CHEM & BIOCHEM SENSOR RES,DEPT APPL ATOM SPECT,
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NR 21

TC 1

Z9 1

PU AOAC INTERNATIONAL

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J9 J AOAC INT

JI J. AOAC Int.

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EP 1090

PG 7

WC Chemistry, Analytical; Food Science & Technology

SC Chemistry; Food Science & Technology

GA XY208

UT WOS:A1997XY20800025

ER

PT J

AU Wittkampf, M
Chemnitius, GC
Cammann, K
Rospert, M
Mokwa, W

AF Wittkampf, M
Chemnitius, GC
Cammann, K
Rospert, M
Mokwa, W

TI Silicon thin film sensor for measurement of dissolved oxygen

SO SENSORS AND ACTUATORS B-CHEMICAL

LA English

DT Article; Proceedings Paper

CT EUROSENSORS X Meeting

CY SEP 08-11, 1996

CL LOUVAIN, BELGIUM

DE Clark-type oxygen sensor; cyclic voltammetry amperometry

ID TRANSDUCERS; ARRAYS

AB A Clark-type oxygen sensor based on a silicon thin film transducer was constructed. The transducer was first electrochemically characterized by cyclic voltammetry and amperometry. Onto the chip a micromachined wafer is attached to form a compartment for the internal electrolyte, which is covered by a gas permeable membrane. In contrast to other miniaturized sensors a microelectrode array was used as cathode showing the typical advantageous microelectrode properties and allowing to measure in both stirred and unstirred solutions, Two different electrode spacings were processed, followed by an investigation of the electrochemical properties, The oxygen sensors were characterized regarding calibration, long ten stability and response. (C) 1997 Elsevier Science S.A.

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NR 9

TC 19

Z9 22

PU ELSEVIER SCIENCE SA

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J9 SENSOR ACTUAT B-CHEM

JI Sens. Actuator B-Chem.

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WC Chemistry, Analytical; Electrochemistry; Instruments & Instrumentation

SC Chemistry; Electrochemistry; Instruments & Instrumentation

GA YM388

UT WOS:000071058600006

ER

PT J

- AU Frebel, H
Chemnitius, GC
Cammann, K
Kakerow, R
Rospert, M
Mokwa, W
- AF Frebel, H
Chemnitius, GC
Cammann, K
Kakerow, R
Rospert, M
Mokwa, W
- TI Multianalyte sensor for the simultaneous determination of glucose, L-lactate and uric acid based on a microelectrode array
- SO SENSORS AND ACTUATORS B-CHEMICAL
- LA English
- DT Article; Proceedings Paper
- CT EUROSENSORS X Meeting
- CY SEP 08-11, 1996
- CL LOUVAIN, BELGIUM
- DE microelectrode array; multianalyte sensor; glucose; L-lactate; uric acid
- AB In this work a microelectrode array was used to develop a multianalyte sensor. Glucose, L-lactate and uric acid were chosen as model analytes. The array consists of ten groups of 40 microelectrodes connected in parallel, each of a size of 36 x 36 μm . Thus the array showed a large overall current response retaining typical microelectrode features. Single rows of electrodes were modified with enzymes entrapped in a polymer matrix. As the three chosen oxidases were used as enzymes hydrogen peroxide generated by the enzymatic reaction was detected by anodic oxidation at + 800 mV vs. Ag/AgCl/3 M KCl. The elimination of interfering substances was accomplished by the application of a NAFION membrane between the electrode surface and the enzyme layer. (C) 1997 Elsevier Science S.A.
- C1 Inst Chemo & Biosensor EV, D-48149 Munster, Germany.
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PU ELSEVIER SCIENCE SA
PI LAUSANNE
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SN 0925-4005
J9 SENSOR ACTUAT B-CHEM
JI Sens. Actuator B-Chem.
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EP 93
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WC Chemistry, Analytical; Electrochemistry; Instruments & Instrumentation
SC Chemistry; Electrochemistry; Instruments & Instrumentation
GA YM388
UT WOS:000071058600013
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