ANALYTICA CHIMICA ACTA

AN INTERNATIONAL JOURNAL DEVOTED TO ALL BRANCHES OF ANALYTICAL CHEMISTRY
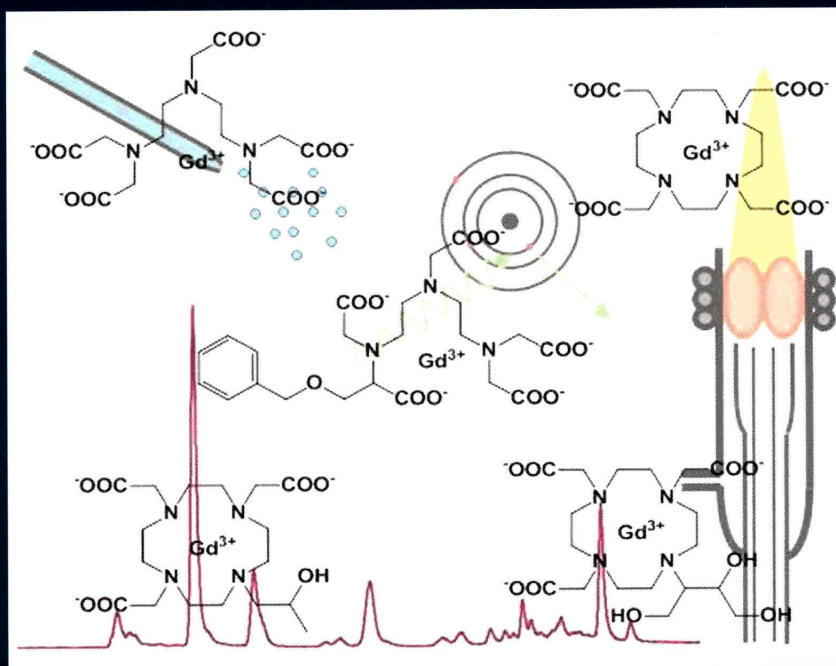
Review Article

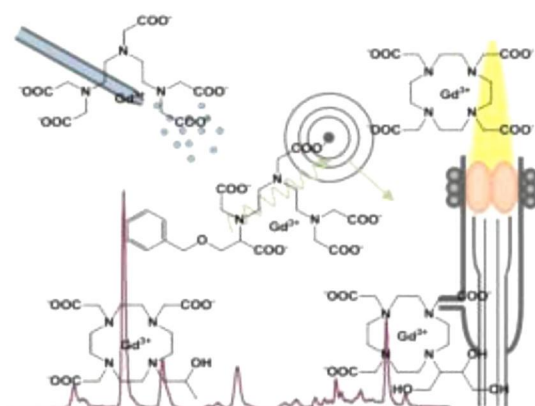Determination of Gadolinium-Based MRI Contrast Agents in Biological and Environmental Samples: A Review

Lena Telgmann, Michael Sperling and Uwe Karst

(Published on pp. 1-16 of this issue)

Analytica Chimica Acta

Editorial Board

Page iii

Review article

Graphical abstract

Highlights

► All major methods for the analysis of Gd-based MRI contrast agents are discussed. ► Biological and environmental samples are covered. ► Pharmacokinetics and species transformation can be investigated. ► The figures of merit as limit of detection and analysis time are described.
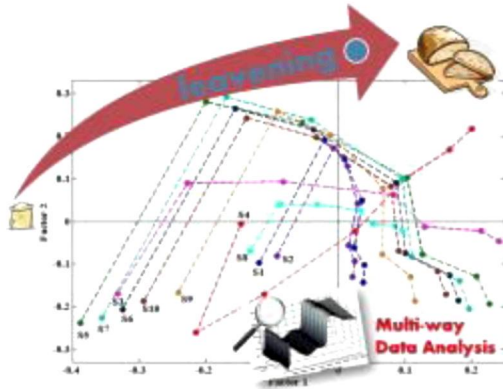
Chemometrics

Mario Li Vigni, Marina Cocchi

Graphical abstract

Highlights

► Dough leavening is studied by means of multi-way methods and NIR spectroscopy. ► Trends of variability of the NIR signal with time (leavening profiles) are obtained. ► Bread properties (e.g. volume) can be predicted from its behavior during leavening. ► Model interpretability is improved through nested mode biplots of PARAFAC loadings.
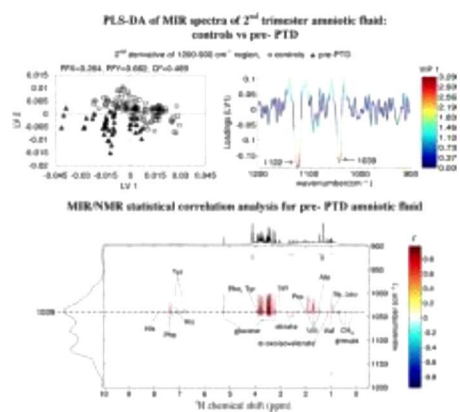
Graphical abstract

PLS-DA of MIR spectra of 2nd trimester amniotic fluid:
controls vs pre- PTD

MIR/NMR statistical correlation analysis for pre- PTD amniotic fluid

Highlights

► First profiling study of amniotic fluid by MIR and multivariate analysis. ► MIR/MIR and MIR/NMR correlation for IR assignment of disease-related metabolites. ► MIR profiling changes related to fetal malformations and preterm delivery. ► Putative interpretation of MIR signatures of fetal malformations/preterm delivery.
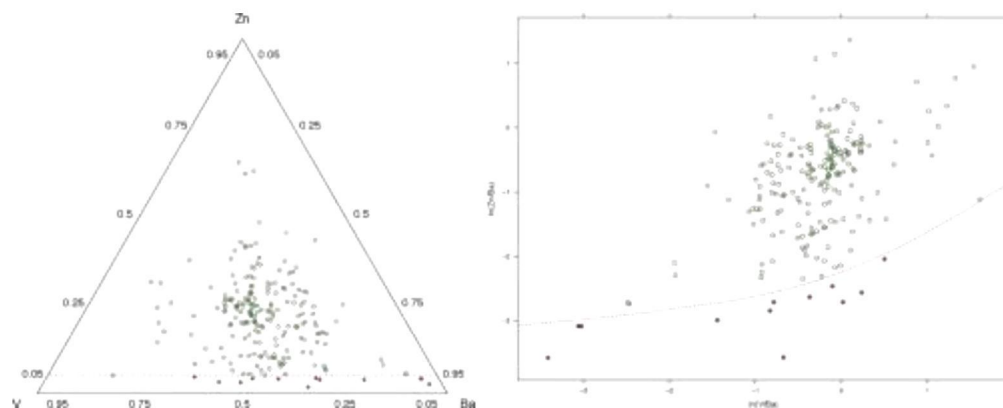
Graphical abstract

Highlights

► Less-than replacement methods for compositional chemical data. ► New model-based univariate multiplicative replacement method. ► Evaluation of competing methods performance. ► Computer code implementing the methods provided.
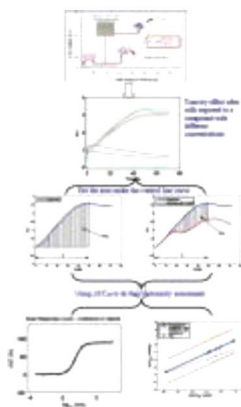
Graphical abstract

Highlights

► Dose- and time-dependent cellular responses are used to evaluate the cytotoxicity. ► The *CI* can reflect the cell number, cell viability and morphological change, *etc.* ► AUC is more relevant to the intensity of the cell treatment. ► AUC_{50} can be used for cytotoxicity assessment. ► AUC_{50} combined with RTCA HT assay can achieve a high-throughput screening.
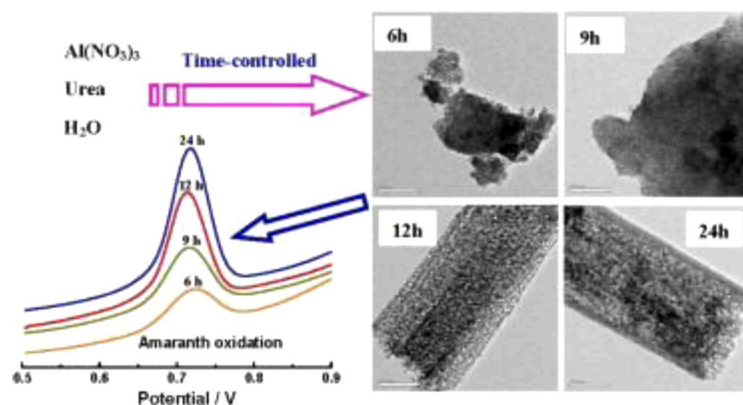
Electrochemistry

Graphical abstract

Highlights

► A facile way to tune morphology and sensing properties of alumina was developed. ► Oxidation activities of amaranth on alumina surface were morphology-dependent. ► Alumina microfibers were more active and greatly increased the signal of amaranth. ► Sensitive, rapid, selective and accurate method was developed for amaranth detection.
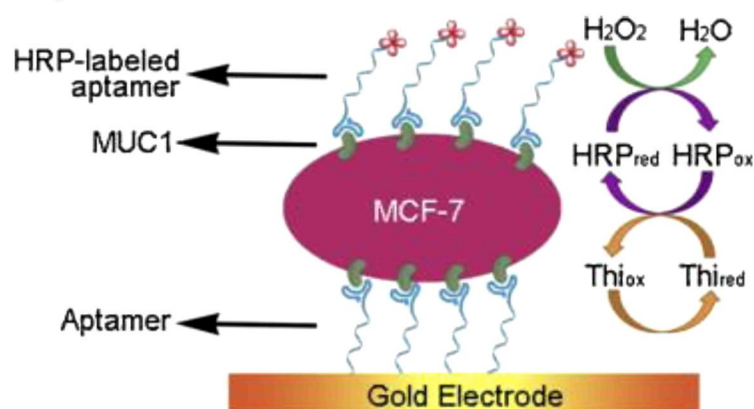
Graphical abstract

Highlights

► An electrochemical biosensor for the detection of MCF-7 cells was fabricated. ► An aptamer–cell–aptamer sandwich architecture was constructed on an electrode. ► Dual-recognition and enzyme-linked amplification were well integrated. ► Favorable sensitivity and selectivity can be achieved.

Molecular Spectrometry

Graphical abstract

Highlights

► Dried urine iodine and creatinine extract quantitatively correlates well with liquid urine. ► Filter paper strips can be easily shipped and stored. ► Urine iodine and creatinine are stable at ambient temperature when dried on filter paper. ► Dried urine iodine and creatinine are run using a 96-well format.
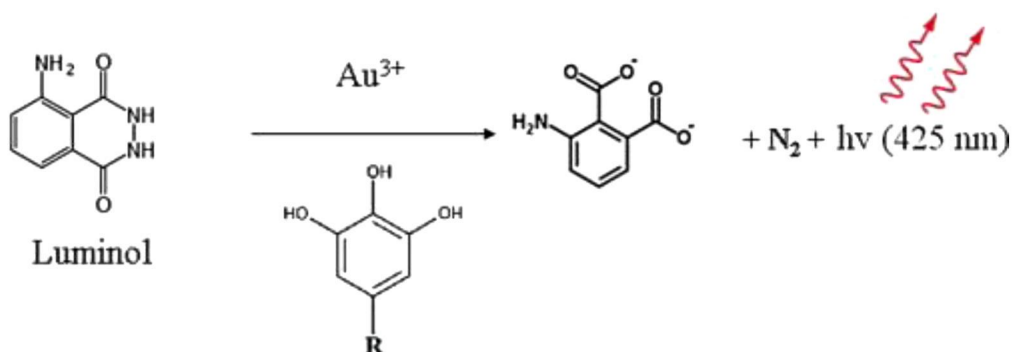
Graphical abstract

Highlights

► Gold is used as an alternative oxidant to luminol under mild conditions. ► Trihydroxybenzoates are selectively determined in complex mixtures. ► The method is straightforward without any interim steps.
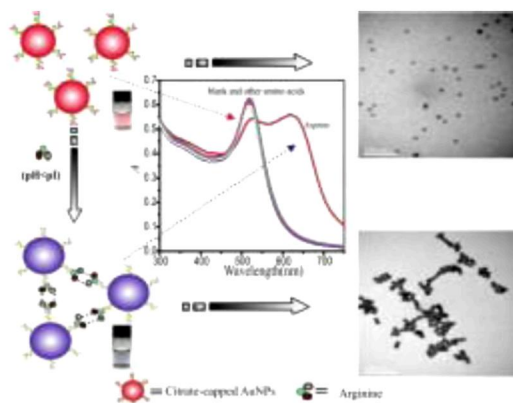
11 ⌐

Visual detection of arginine based on the unique guanidino group-induced aggregation of gold nanoparticles

Original Research Article

Pages 78-83

Wendan Pu, Huawen Zhao, Chengzhi Huang, Liping Wu, Dan Xu

Graphical abstract

Highlights

► A simple, fast and novel colorimetric method for arginine detection was developed. ► This method showed high sensitivity and selectivity. ► As low as 0.4 μM arginine could be easily detected by the naked eye. ► This method was successfully used to detect arginine in real samples.
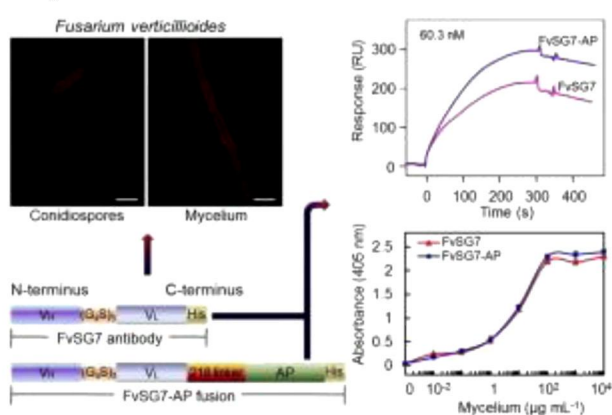
12

A phage-displayed chicken single-chain antibody fused to alkaline phosphatase detects *Fusarium* pathogens and their presence in cereal grains
Original Research Article
Pages 84-92
Zu-Quan Hu, He-Ping Li, Jing-Bo Zhang, Tao Huang, Jin-Long Liu, Sheng Xue, Ai-Bo Wu, Yu-Cai Liao

Graphical abstract

Highlights

► Generation of a highly reactive scFv antibody against *F. verticillioides*. ► Localization of the antibody binding to the surface target of *F. verticillioides*. ► Expression of the antibody–alkaline phosphatase (AP) fusion linked by a 218 linker. ► The antibody–AP fusion has a higher affinity than the parental antibody. ► The antibody–AP fusion detects toxigenic *Fusarium* pathogens in cereal grains.