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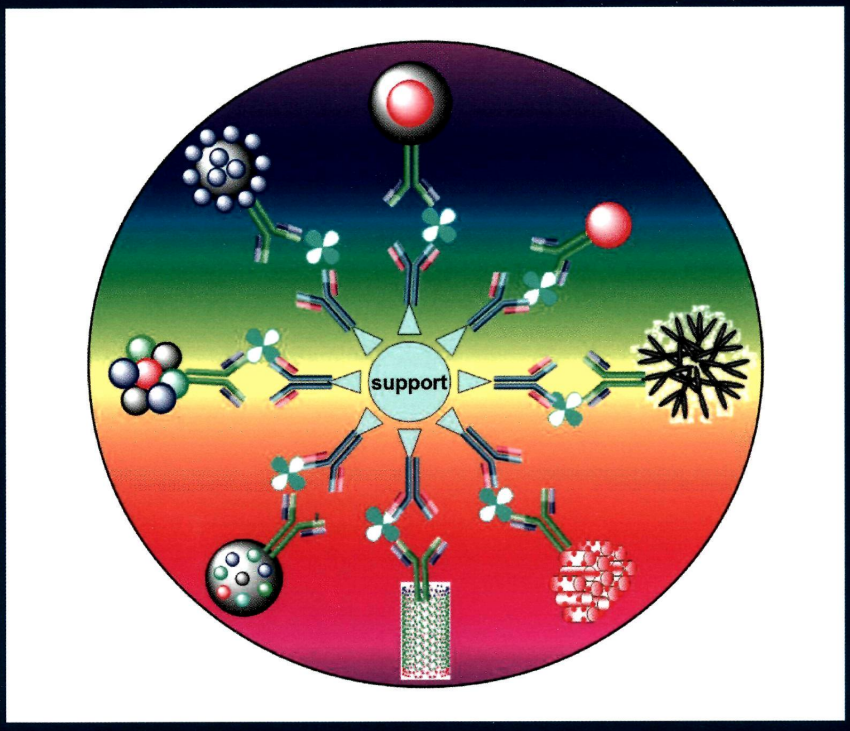


Review Article

Sandwich-type immunosensors and immunoassays exploiting nanostructure labels: A review

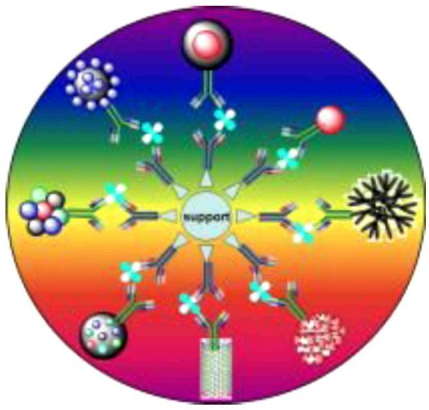
Xiaomei Pei, Bing Zhang, Juan Tang, Bingqian Liu, Wenqiang Lai and Dianping Tang

(Published on pp. 1–18 of this issue)

Analytica Chimica Acta

Volume 758, Pages 1-144 (3 January 2013)

Graphical abstract



Highlights

► Sandwich-type immunosensors and immunoassays exploiting nanostructure labels. ► Nanolabel-based electrochemical immunosensing and immunoassay. ► Nanolabel-based optical immunosensors and immunoassays. ► Nanolabel-based mass-sensitive immunosensing. ► Nanolabel-based multianalyte immunoassays.

Atomic Spectrometry

chromium, mercury and lead in polycarbonate
Original Research Article
Pages 19-27
Kil Jae Lee, Yeo Jin Lee, Young Rak Choi, Jeong Sook Kim, Youn Sung Kim, Soo Bong Heo

Graphical abstract

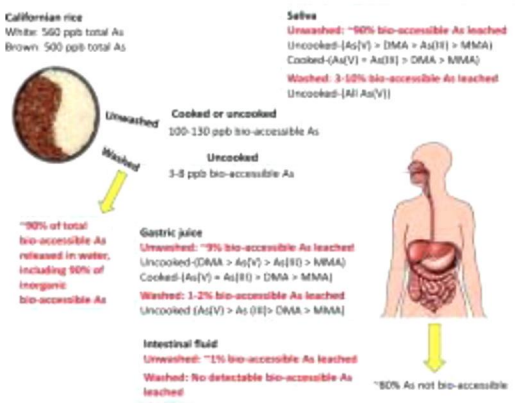
Highlights

► RMs for the determination of Cd, Cr, Hg and Pb in polycarbonate were developed. ► Double ID-ICP-MS technique was used for characterization of candidate RMs. ► The certified values for the elements ranged from 51.7 to 1133 mg kg^{-1}. ► The relative expanded uncertainties were shown to be less than 5.4%. ► New RMs were found to be suitable for the RoHS compliant tests.

4

The effect of cooking and washing rice on the bio-accessibility of As, Cu, Fe, V and Zn using an on-line continuous leaching method
Original Research Article
Pages 28-35
Nolan S. Horner, Diane Beauchemin

Graphical abstract



Highlights

► Cooking long grain brown or white rice does not affect the bio-accessibility of arsenic. ► Four toxic As species in saliva and gastric juice leachates were separated by one method. ► Washing rice a few min prior to cooking removes about 90% of bio-accessible arsenic. ► Cooking long grain brown or white rice appears to convert some species to As(III). ► On-line leaching provides in a few min similar results to 2 h/reagent batch methods.

Chemometrics

5

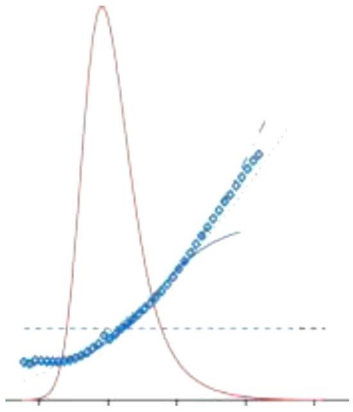
New approaches based on modified Gaussian models for the prediction of chromatographic peaks

Original Research Article

Pages 36-44

J.J. Baeza-Baeza, C. Ortiz-Bolsico, M.C. García-Álvarez-Coque

Graphical abstract



Highlights

► Modified Gaussian models expressed as a function of experimental halfwidths. ► Enhancement of peak models through the application of restrictions. ► Peak models checked on chromatographic peaks of diverse origin and asymmetry. ► Increased reliability of the peak models in tasks requiring peak fitting and prediction. ► Parabolic-Lorentzian Gaussian improved applicability for optimisation of peak resolution.

6

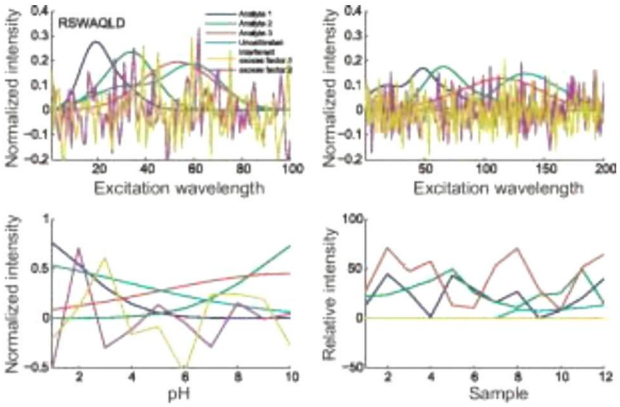
An alternative quadrilinear decomposition algorithm for four-way calibration with application to analysis of four-way fluorescence excitation–emission–pH data array

Original Research Article

Pages 45-57

Chao Kang, Hai-Long Wu, Yong-Jie Yu, Ya-Juan Liu, Shu-Rong Zhang, Xiao-Hua Zhang, Ru-Qin Yu

Graphical abstract



Highlights

► A new quadrilinear decomposition algorithm for four-way calibration is presented. ► Simulations and experiments show RSWAQLD has the feature of fast convergence. ► The proposed algorithm can resist the influence of the excess factors. ► The analysis of real four-way fluorescence data corroborated above-mentioned features.

7

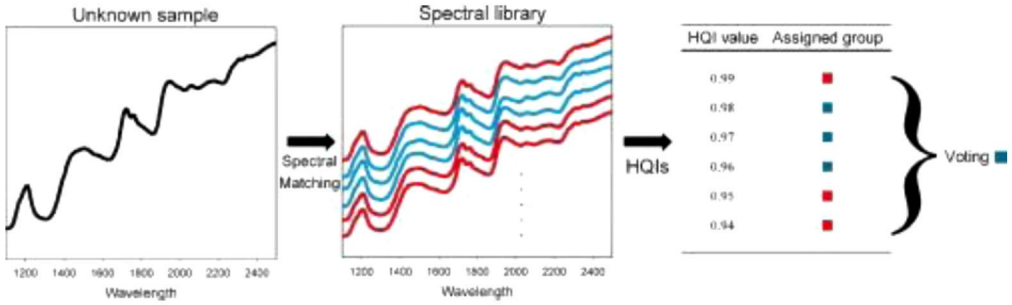
New discrimination method combining hit quality index based spectral matching and voting

Original Research Article

Pages 58-65

Sanguk Lee, Hyeseon Lee, Hoeil Chung

Graphical abstract



Highlights

► A discrimination method, called hit quality index (HQI)-voting, has been developed. ► It effectively utilizes HQI as a judgment factor for group determination. ► It is based on sample-to-sample spectral matching without modeling, so the model over-fitting is not an issue. ► It improved the discrimination for geographical origins of agricultural samples and similar petroleum products.

Electrochemistry

8

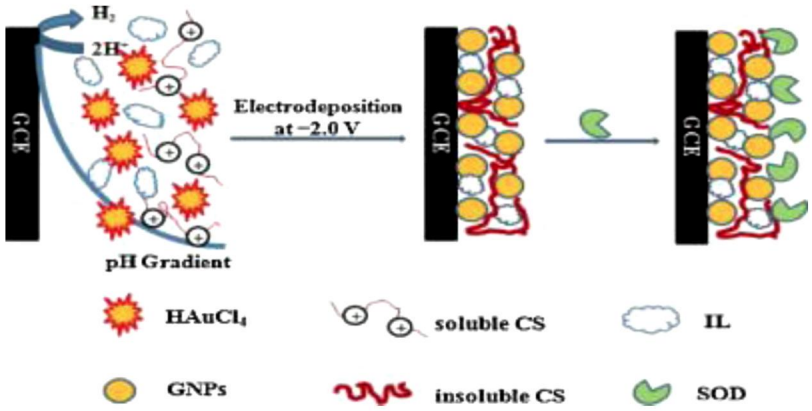
A novel amperometric biosensor for superoxide anion based on superoxide dismutase immobilized on gold nanoparticle-chitosan-ionic liquid biocomposite film

Original Research Article

Pages 66-71

Lu Wang, Wei Wen, Huayu Xiong, Xiuhua Zhang, Haoshuang Gu, Shengfu Wang

Graphical abstract



Highlights

► SOD was immobilized in gold nanoparticles-chitosan-ionic liquid (GNPs-CS-IL) film. ► The biosensor was constructed by one-step ultrasonic electrodeposition of GNPs-CS-IL onto GCE. ► The biosensor showed excellent analytical performance for O_2^- real-time analysis.

9

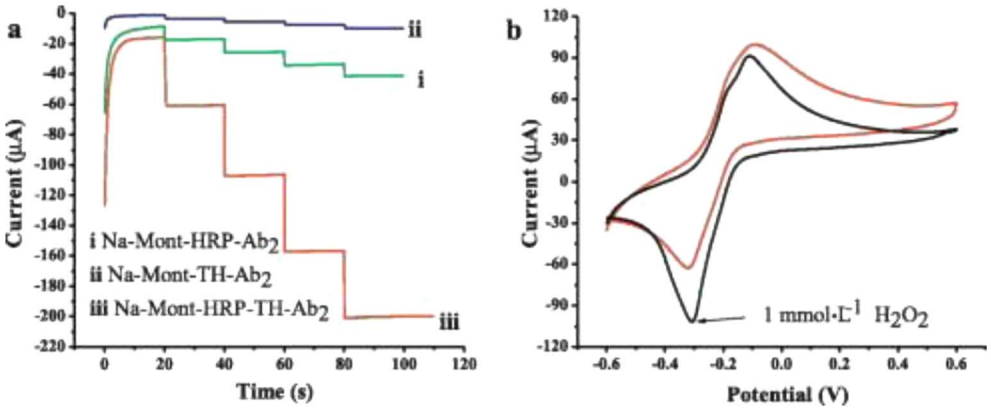
Ultrasensitive electrochemical immunosensor for zeranol detection based on signal amplification strategy of nanoporous gold films and nano-montmorillonite as labels

Original Research Article

Pages 72-79

Rui Feng, Yong Zhang, He Li, Dan Wu, Xiaodong Xin, Sen Zhang, Haiqin Yu, Qin Wei, Bin Du

Graphical abstract



Highlights

► The immunosensor based on nanoporous gold films and nano-montmorillonite. ► Nano-montmorillonite with innocuity, and adsorptivity can be used as labels. ► Determine zeranol utilizing peculiar immunology reaction of antibody and antigen.

Extraction and Sample Handling

10

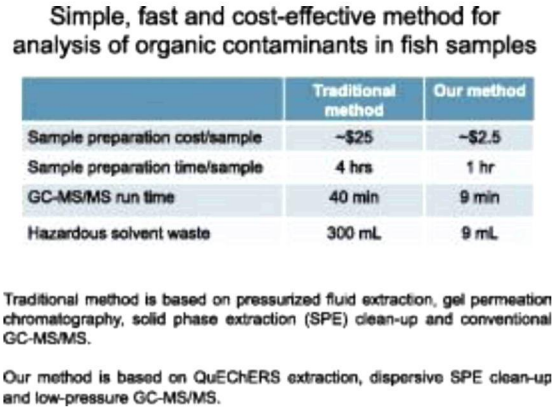
Multi-class, multi-residue analysis of pesticides, polychlorinated biphenyls, polycyclic aromatic hydrocarbons, polybrominated diphenyl ethers and novel flame retardants in fish using fast, low-pressure gas chromatography–tandem mass spectrometry

Original Research Article

Pages 80-92

Yelena Sapozhnikova, Steven J. Lehotay

Graphical abstract



Highlights

► A method for analysis of POPs and novel flame retardants in catfish was developed. ► The method is based on a QuEChERS extraction, d-SPE clean-up and low pressure GC/MS–MS. ► The method validation demonstrated good recoveries and low detection limits. ► The method was successfully applied for analysis of catfish samples from the market.

11

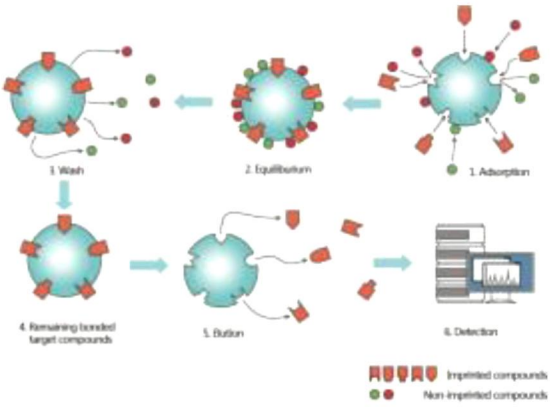
Selective trace enrichment of acidic pharmaceuticals in real water and sediment samples based on solid-phase extraction using multi-templates molecularly imprinted polymers

Original Research Article

Pages 93-100

Yan-Ping Duan, Chao-Meng Dai, Ya-Lei Zhang, Ling-Chen

Graphical abstract



Highlights

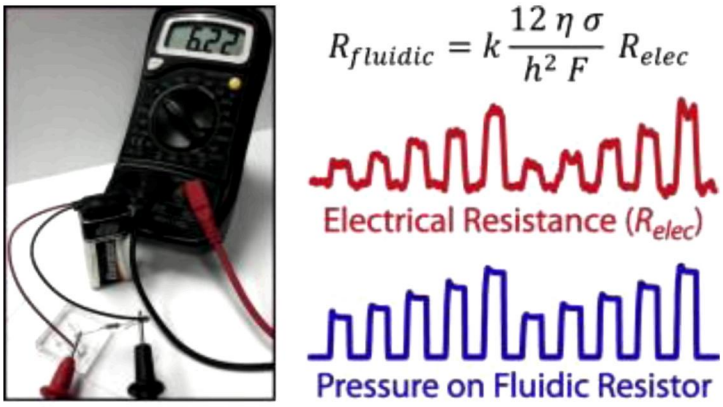
► A novel multi-templates MIP was prepared using acidic pharmaceuticals mix as the template. ► Optimization of a protocol of extraction based on molecularly imprinted solid phase extraction (MISPE). ► Application of the optimized protocol for the extraction of acidic pharmaceuticals from real environmental samples.

Flow Analysis

12

Measurement of microchannel fluidic resistance with a standard voltage meter
Original Research Article
Pages 101-107
Leah A. Godwin, Kennon S. Deal, Lauren D. Hoepfner, Louis A. Jackson, Christopher J. Easley

Graphical abstract



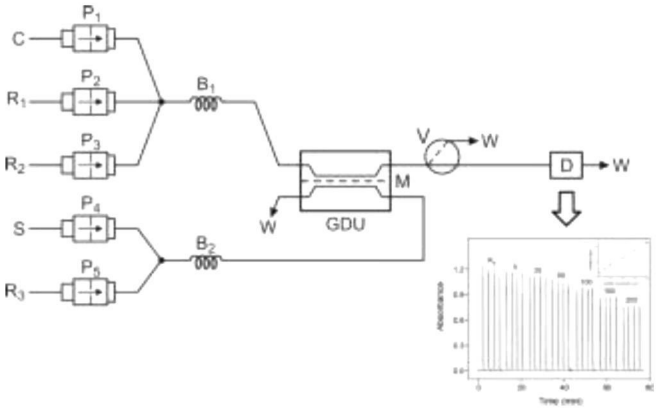
Highlights

► Standard voltage meter used to measure fluidic resistance. ► Manual measurement takes a few seconds, akin to electrical resistance measurements. ► Measurement error is reduced compared to other approaches. ► Amenable to dynamic measurement of fluidic resistance.

13

A multi-pumping flow-based procedure with improved sensitivity for the spectrophotometric determination of acid-dissociable cyanide in natural waters
Original Research Article
Pages 108-113
Rejane M. Frizzarin, Fábio R.P. Rocha

Graphical abstract



Highlights

► Inexpensive, fast and environmentally friendly spectrophotometric determination of acid dissociable cyanide. ► Novel analytical method based on the reaction with the Cu(I) complex with 2,2′-biquinoline 4,4′-dicarboxylic acid. ► Long pathlength spectrophotometry exploited for the first time to increase sensitivity in discolorimetry. ► Pulsed flow to improve gas-diffusion efficiency. ► One of the lowest detection limits without impairing the sample throughput or using toxic chemicals.

Mass Spectometry

14

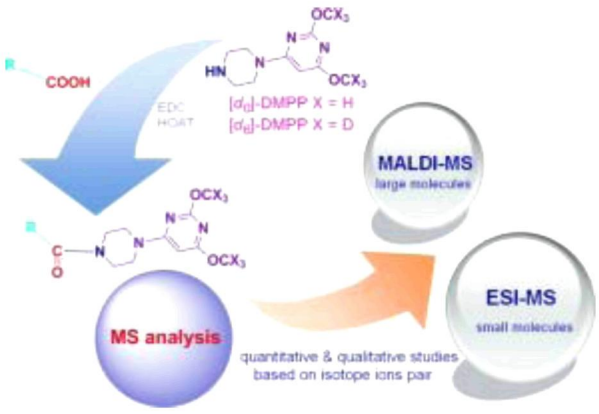
A highly sensitive isotope-coded derivatization method and its application for the mass spectrometric analysis of analytes containing the carboxyl group

Original Research Article

Pages 114-121

Jiapeng Leng, Haoyang Wang, Li Zhang, Jing Zhang, Hang Wang, Yinlong Guo

Graphical abstract



Highlights

► A novel MS-based isotope reagent DMPP was developed for the derivatization toward carboxyl group. ► The simple and rapid labeling reaction was carried out under mild conditions with high specificity. ► The LODs of analytes containing the carboxyl and excess labeling reagent were greatly reduced. ► Enhanced accuracy in peptide sequencing was achieved by the introduction of isotope-coded DMPP.

Molecular Spectrometry

15

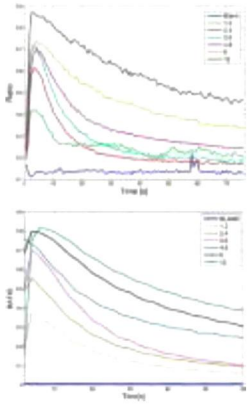
Comparison of the performance of three ion mobility spectrometers for measurement of biogenic amines

Original Research Article

Pages 122-129

Zeev Karpas, Ana V. Guamán, Antonio Pardo, Santiago Marco

Graphical abstract



Highlights

► First comparison of performance of IMS devices. ► Gas-phase ion chemistry affected by operational parameters. ► Limits of detection quite similar despite differences in devices. ► LODs determined in controlled continuous flow and in headspace vapor. ► Exponential dilution of headspace studies.

Sensors and Bioselective Reagents

16

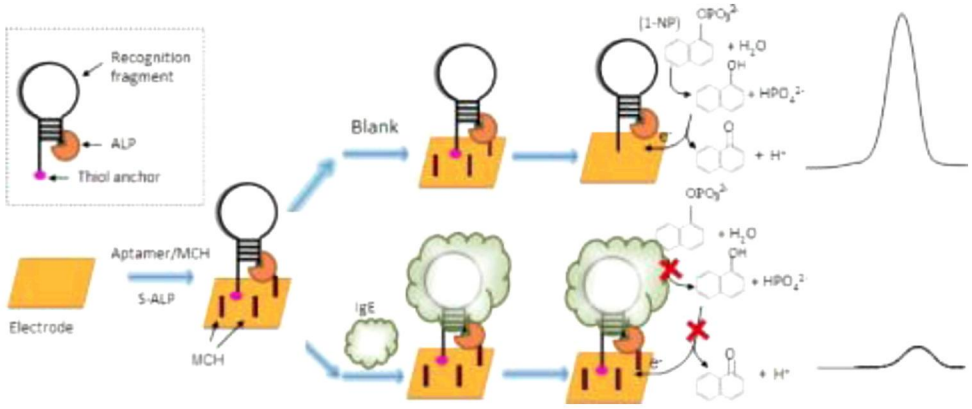
An electronic channel switching-based aptasensor for ultrasensitive protein detection

Original Research Article

Pages 130-137

Hongbo Li, Cui Wang, Zaisheng Wu, Limin Lu, Liping Qiu, Hui Zhou, Guoli Shen, Ruqin Yu

Graphical abstract



Highlights

► Target IgE is successfully designed to serve as a barrier to separate enzyme from its substrate. ► This sensing platform of electronic channel switching-based aptasensor can be simply manipulated. ► The stable hairpin structure of anti-IgE aptamer is utilized to detect target IgE. ► The sensor is ultrasensitive sensitivity, excellent selectivity and small volume of sample. ► It is a powerful platform to be further expanded to detect more kinds of proteins and even cells.

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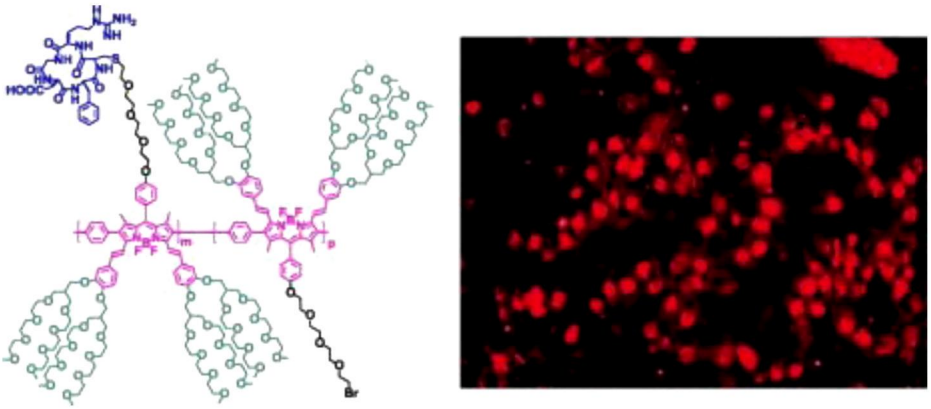
Highly water-soluble, near-infrared emissive BODIPY polymeric dye bearing RGD peptide residues for cancer imaging

Original Research Article

Pages 138-144

Shilei Zhu, Jingtuo Zhang, Jagadeesh Janjanam, Jianheng Bi, Giri Vegesna, Ashutosh Tiwari, Fen-Tair Luo, Jianjun Wei, Haiying Liu

Graphical abstract



Highlights

► Highly water-soluble near-infrared emissive BODIPY polymeric dye bearing bromide groups (polymer **A**) was prepared. ► BODIPY polymeric dye bearing RGD peptides (polymer **B**) was prepared by post-polymerization functionalization. ► Polymer **B** was used for specific near-infrared fluorescence imaging of breast cancer cells.