

QK1720284

ISSN 1004-4957

CODEN: FCEXES

CN 44-1318/TH

中文核心期刊

# 分析测试学报



FENXI CESHIXUEBAO

JOURNAL OF INSTRUMENTAL ANALYSIS

Vol. 36 No. 7  
2017



ISSN 1004-4957  
9 771004 495178



万方数据

中国广州分析测试中心 主办  
中国分析测试协会

## 目次

### 研究报告

- 841 固相微萃取/气相色谱-质谱研究沉香的特征成分  
.....张静斐, 吴惠勤, 黄晓兰, 林晓珊, 侯思润, 黄少伟
- 849 QuEChERS/超高效液相色谱-串联质谱法测定果蔬中122种香港规  
例农药残留  
.....张建莹, 邓慧芬, 李月梅, 林珊, 岳振峰, 吴卫东
- 858 分散固相萃取净化/液相色谱-串联质谱法测定化妆品中7种氨基  
苯甲醚.....黄嘉乐, 李秀英, 寻知庆, 王强, 黄金凤, 郭新东
- 865 基于石墨烯基复合物和聚天青I的HRP传感器检测有机过氧化物的  
研究.....丁绍卿, 杨绍明, 李玲玲, 杨杰, 曹婧, 查文玲
- 870 顶空/气相色谱法测定橡皮擦中挥发性苯及苯系物  
.....杨琦, 刘世栋, 赵丽莉, 巩泽龙
- 876 固相萃取/超高效液相色谱-串联质谱法快速测定不同水体中5种  
人造甜味剂、6种造影剂及咖啡因  
.....杨愿愿, 应光国, 赵建亮, 刘有胜, 柳王荣
- 882 基于QuEChERS提取的超高效液相色谱-串联质谱法测定小麦粉  
中5种镰刀菌毒素.....杨军, 孙小杰, 胡文彦, 王玉梅

### 研究简报

- 887 纳米 $Fe_2O_3$ 修饰涂碳型硫酸沙丁胺醇选择电极的研制与应用  
.....张静, 窦月, 岳京立
- 892 玩具油漆涂层中有机锡检测能力验证样品研制及应用分析  
.....刘崇华, 丁志勇,  
杨丹华, 刘松杰, 田勇, 蚁乐洲, 黄宁娜, 李函珂
- 897 QuEChERS/UPLC-MS/MS法测定水产品中孔雀石绿和结晶紫及其  
代谢物.....宫小明, 华萌萌, 王洪涛, 王炳军, 马荣栓
- 902 MIP-SERS技术快速检测中药中非法添加的茶碱  
.....胡然, 陆峰, 卞筱泓, 许激扬
- 906 高效液相色谱-四极杆/线性离子阱质谱仪测定盐酸黄酮哌酯中的  
1-(2-羟乙基)哌啶残留.....许洁, 周长朋, 郑文凤, 王春玲
- 911 气相色谱-串联质谱检测烟草中15种苯氧羧酸类除草剂残留  
.....曹桂红, 王兴宁
- 916 SPE/GC-MS/SIM法同时测定水中7类27种SVOCs的方法研究  
.....董军, 刘同喆, 袁鹏辉, 殷淑翠
- 921 利巴韦林原位聚合分子印迹电化学传感器的研制  
.....华彦涛, 徐振林, 王弘, 杨金易, 孙远明, 沈玉栋

本期封面根据849-857页文章设计

# 分析测试学报

第36卷 第7期

2017年7月25日出版

月刊, 1982年创刊

刊名题字: 启功

主办单位: 中国广州分析测试中心

中国分析测试协会

主管单位: 广东省科学院

主 编: 陈小明

副主编: 庞国芳 江桂斌 吴惠勤(常务)

郑建国 王海水

编辑部主任: 吴惠勤

国际标准连续出版物号: ISSN 1004-4957

国内统一连续出版物号: CN44-1318/TH

CODEN: FCXEXS

发行范围: 国内外公开发行

总发行处: 广东省报刊发行局

邮发代号: 46-104

订购处: 全国各地邮局

定价: 18.00元/册

国外总发行: 中国国际图书贸易总公司

国外发行代号: BM6013

广告经营许可证: 440000100186

编辑出版: 《分析测试学报》编辑部

地址: 广州市先烈中路100号(510070)

电话: 020-37656606, 87684776(传真)

E-mail: fxcxb@china.com

http://www.fxcxb.com

印刷: 广州市新齐彩印刷有限公司

本期责任编辑: 丁岩 龙秀芬

盛文彦 周启动

- \* 中文核心期刊
- \* 中国分析测试协会会刊
- \* 广东省优秀期刊
- \* 广东省优秀科技期刊
  
- \* 中国科技论文统计源期刊(中国科技核心期刊)
- \* 《中国科学引文数据库》来源期刊
- \* 《中国科技期刊数据库》来源期刊
- \* 《中国学术期刊(光盘版)》收录期刊
- \* 《中国期刊网》全文收录期刊
- \* 《中国科技期刊精品数据库》收录期刊
- \* 美国《化学文摘》(CA)收录期刊
- \* 俄罗斯《文摘杂志》收录期刊
- \* 日本科学技术社科学技术数据库收录期刊
- \* 英国皇家化学学会《分析文摘》(AA)及《质谱》(MBS)系统摘录期刊

### 《分析测试学报》 第五届编委会成员

顾问(以姓氏笔划排序):

计亮年 张玉奎 汪尔康  
周同惠 俞汝勤 姚守拙

主编: 陈小明

副主编: 庞国芳 江桂斌

吴惠勤(常务) 郑建国 王海水

编委(以姓氏笔划排序):

王小如 王峰涛 王海水 邓志威  
冯建跃 叶文才 再帕尔·阿不力孜  
刘国诠 刘虎威 刘清珺 孙卫东  
孙泽明 朱炳辉 毕树平 江云宝  
江桂斌 牟德海 许国旺 严秀平  
吴侔天 吴惠勤 张学敏 张新荣  
李红梅 李攻科 李晓东 杨生荣  
杨芑原 杨培慧 汪正范 汪国权  
肖宏展 邹汉法 陈义 陈小明  
陈杭亭 陈纘光 庞国芳 罗国安  
金长文 郑建国 胡继明 赵睿  
党志 袁若 贾云海 郭寅龙  
梁逸曾 章晓中 黄业茹 黄承志  
储晓刚 谢剑炜 褚小立 赖家平  
熊少祥 臧慕文 薛巍 鞠焯先

## 目次

- 925 高效液相色谱-电感耦合等离子体质谱法测定化妆品中2-溴-2-硝基-1,3-丙二醇..... 王枚博, 钟吉强, 陈丹丹, 毛北萍, 王欣美, 郑荣, 刘畅, 王柯

### 实验技术

- 929 超声萃取/HPLC-MS检测电子电气产品聚合物中的六溴环十二烷.....陈琼, 黄秋鑫, 姜涛, 丑天姝, 方亮, 吴琴
- 933 反门控去耦技术在定量<sup>1</sup>H NMR测定苯乙醇胺A纯度中的应用.....宋印清, 王敏, 王彤彤, 周剑, 杨梦瑞
- 937 一种检测水合肼荧光探针的合成与应用.....张琪, 高潮, 梁焕如, 侯鹏

### 综述

- 941 乳制品中兽药多种类残留的液相色谱-质谱分析研究进展.....张璐琪, 张鸿伟, 梁成珠, 张晓梅, 鲍蕾, 王培锋

◇ 《分析测试学报》2018年征订启事(848)

# Journal of Instrumental Analysis

Vol. 36, No. 7

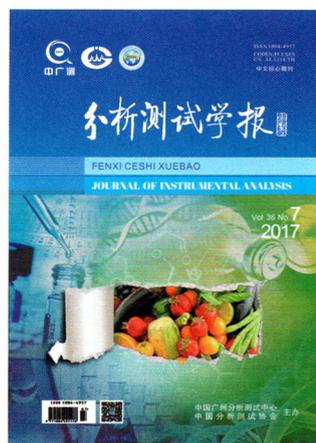
Jul. 25, 2017

Sponsored by China National Analysis Center, Guangzhou  
and China Association for Instrumental Analysis

Editor-in-chief: CHEN Xiaoming

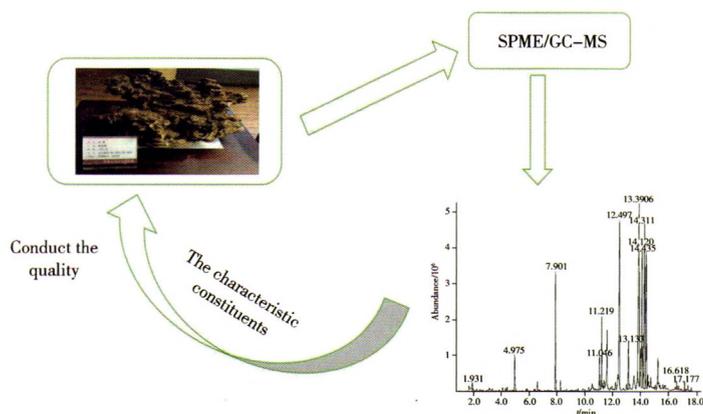
Edited & published by the editorial office of Journal of Instrumental Analysis

(E-mail: fxcspb@china.com, http://www.fxcspb.com)



## Contents

### Scientific Papers

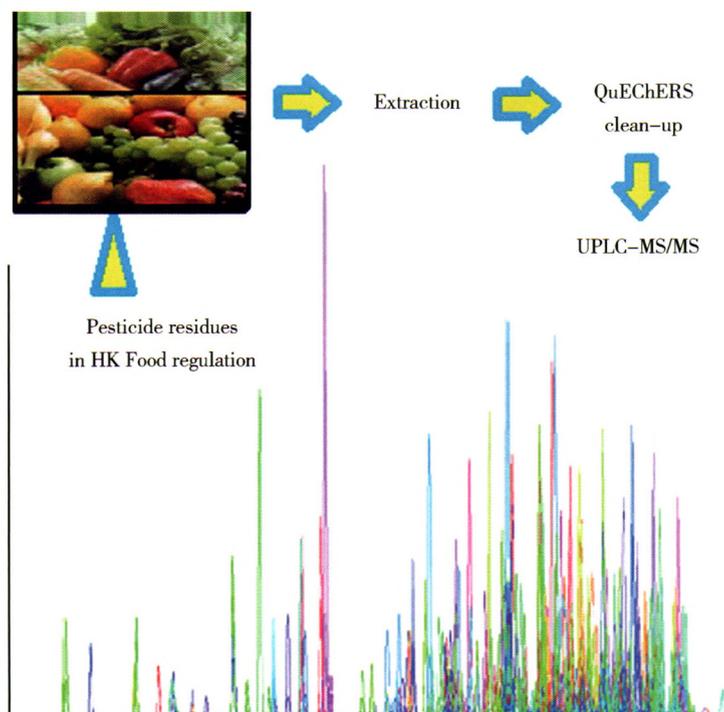


#### Investigation on Characteristic Constituents of Agarwood by SPME/GC-MS

ZHANG Jing-fei, WU Hui-qin, HUANG Xiaolan, LIN Xiao-shan, HOU Si-run, HUANG Shao-wei

*J. Instrum. Anal.*, 2017, 36(7): 841-848.

doi: 10.3969/j.issn.1004-4957.2017.07.001

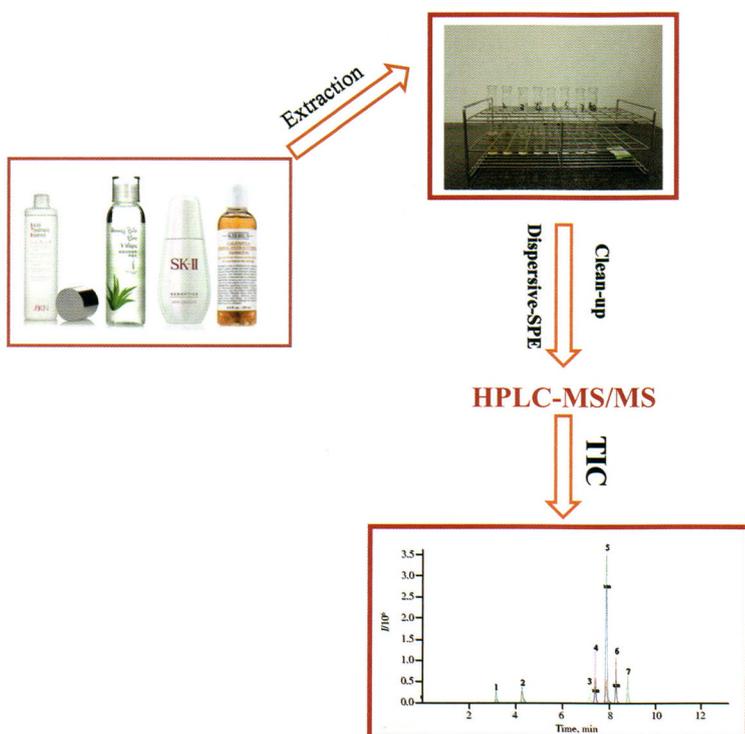


#### Determination of 122 Pesticide Residues in Fruits and Vegetables from Regulation of Pesticides in Hong Kong by QuEChERS Combined with Ultra Performance Liquid Chromatography-Tandem Mass Spectrometry

ZHANG Jian-ying, DENG Hui-fen, LI Yue-mei, LIN Shan, YUE Zhen-feng, WU Weidong

*J. Instrum. Anal.*, 2017, 36(7): 849-857.

doi: 10.3969/j.issn.1004-4957.2017.07.002



### Determination of Seven Aminoanisoles in Cosmetics by Dispersive Solid Phase Extraction Purification Coupled with Liquid Chromatography – Tandem Mass Spectrometry

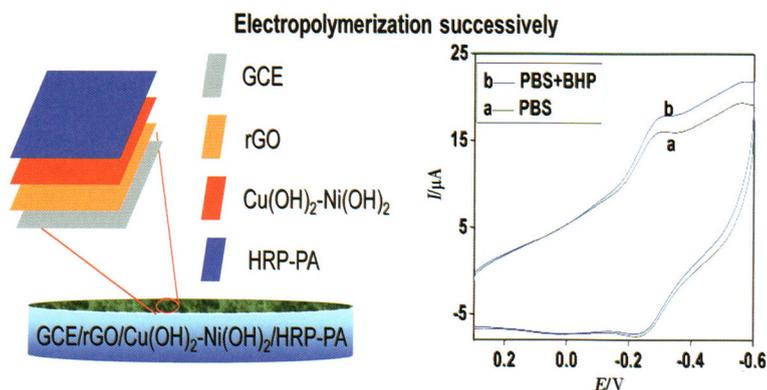
HUANG Jia-le, LI Xiu-ying, XUN Zhi-qing, WANG Qiang, HUANG Jin-feng, GUO Xin-dong

*J. Instrum. Anal.* , 2017, 36(7) : 858 – 864.  
doi: 10.3969/j. issn. 1004 – 4957. 2017. 07. 003

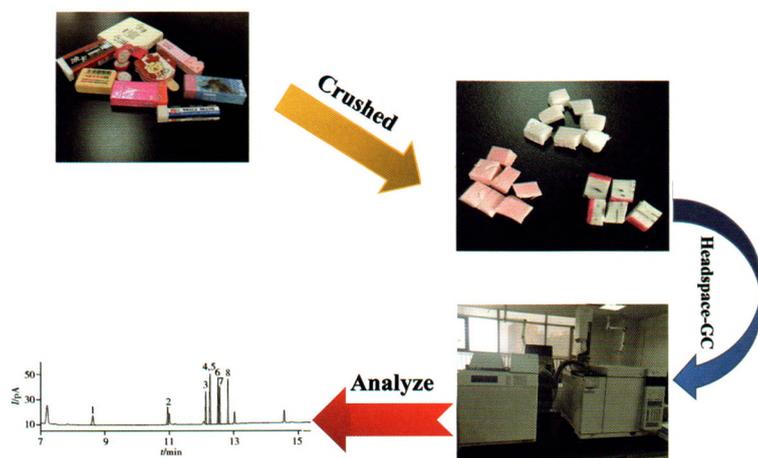


### Study on Determination of Organic Peroxides with HRP Sensor Based on Graphene Nanocomposites and Poly Azure I

DING Shao-qing, YANG Shao-ming, LI Ling-ling, YANG Jie, CAO Qiang, ZHA Wen-ling



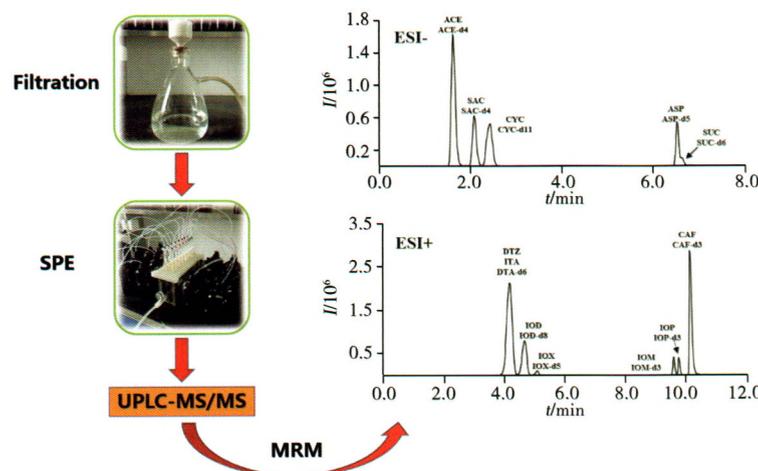
*J. Instrum. Anal.* , 2017, 36(7) : 865 – 869.  
doi: 10.3969/j. issn. 1004 – 4957. 2017. 07. 004



**Determination of the Volatile Benzene and Benzene Homologues in Eraser by Headspace with Gas Chromatography**

YANG Qi, LIU Shi-dong, ZHAO Li-li, GONG Ze-long

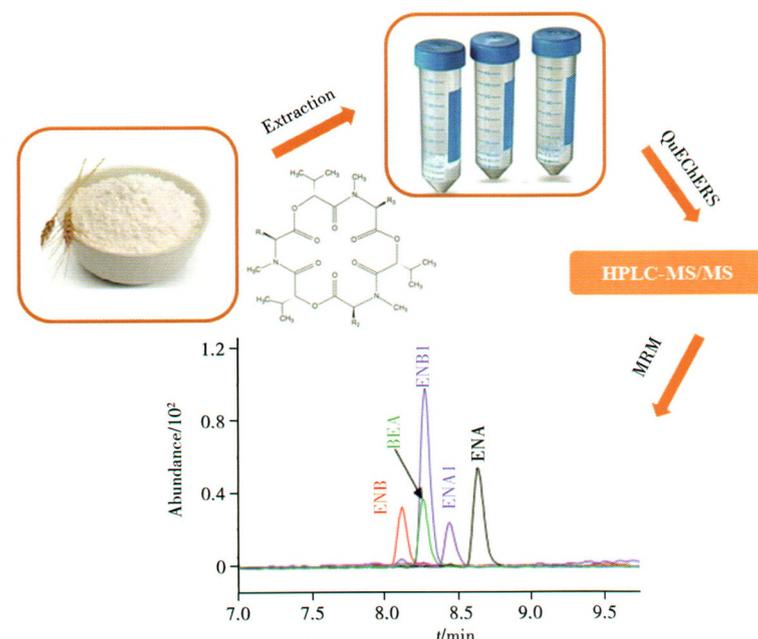
*J. Instrum. Anal.* , 2017, 36(7) : 870 – 875.  
doi: 10.3969/j. issn. 1004 – 4957. 2017. 07. 005



**Rapid Determination of Five Artificial Sweeteners, Six Iodinated X-ray Contrast Agents and Caffeine in Different Water Samples by Solid Phase Extraction with Ultra Performance Liquid Chromatography – Tandem Mass Spectrometry**

YANG Yuan-yuan, YING Guang-guo, ZHAO Jian-liang, LIU You-sheng, LIU Wang-rong

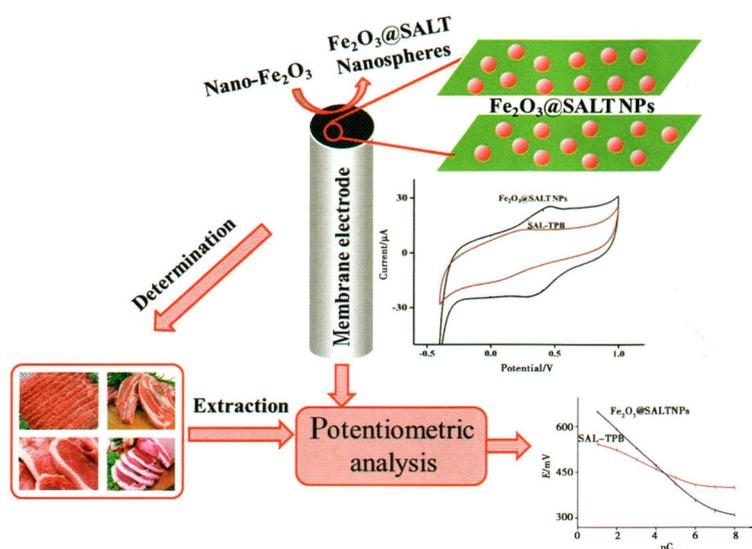
*J. Instrum. Anal.* , 2017, 36(7) : 876 – 881.  
doi: 10.3969/j. issn. 1004 – 4957. 2017. 07. 006



**Determination of 5 Fusarium Mycotoxins in Wheat Flour by QuEChERS Extraction Combined with Ultra Performance Liquid Chromatography – Tandem Mass Spectrometry**

YANG Jun, SUN Xiao-jie, HU Wen-yan, WANG Yu-mei

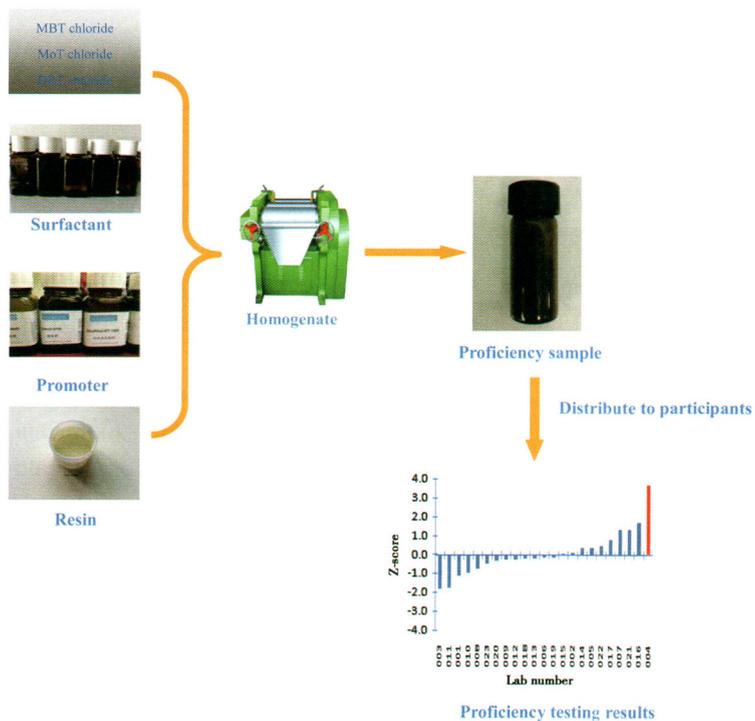
*J. Instrum. Anal.* , 2017, 36(7) : 882 – 886.  
doi: 10.3969/j. issn. 1004 – 4957. 2017. 07. 007



**Preparation and Application of Carbon Coated Polyvinyl Chloride Membrane Salbutamol Sulfate Selective Electrode Modified with Nano-Fe<sub>2</sub>O<sub>3</sub>**

ZHANG Jing, DOU Yue, YUE Jing-li

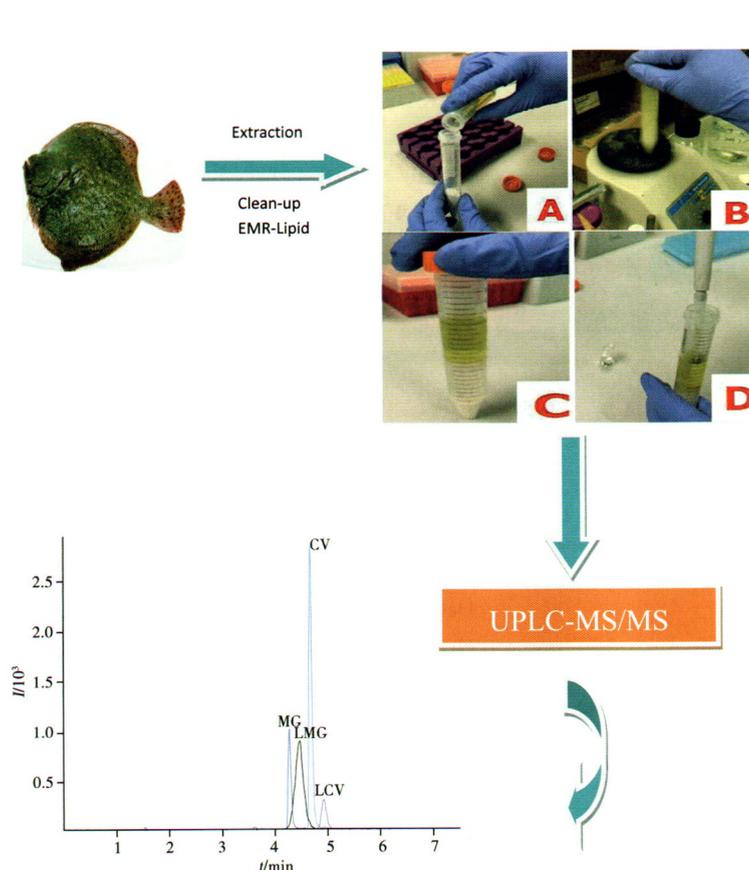
*J. Instrum. Anal.*, 2017, 36(7): 887 – 891.  
doi: 10.3969/j.issn.1004-4957.2017.07.008



**Preparation of Proficiency Testing Sample for Migration Organic Tin in Toys Paint Coating and Its Application**

LIU Chong-hua, DING Zhi-yong, YANG Dan-hua, LIU Song-jie, TIAN Yong, YI Le-zhou, HUANG Ning-shan, LI Han-ke

*J. Instrum. Anal.*, 2017, 36(7): 892 – 896.  
doi: 10.3969/j.issn.1004-4957.2017.07.009

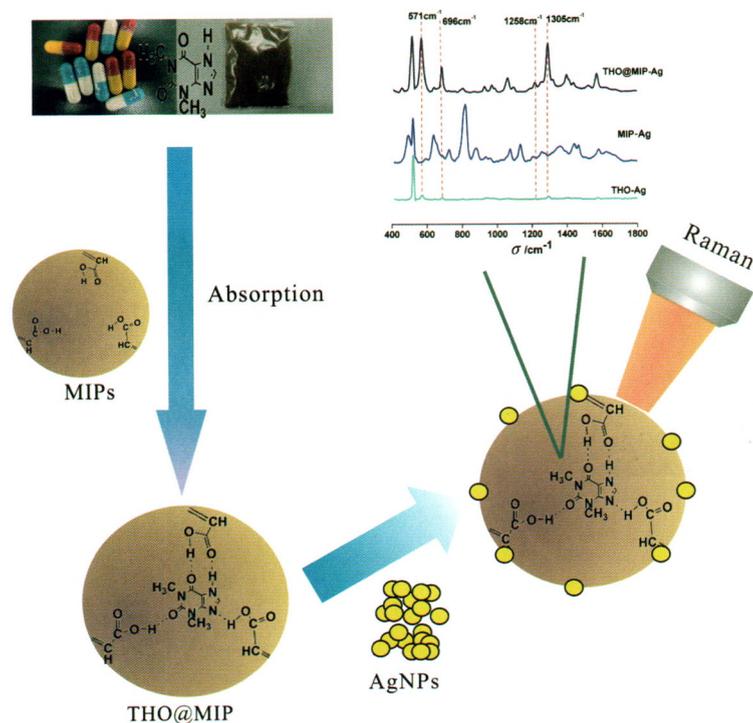


**Determination of Malachite Green, Crystal Violet and Their Metabolites Residues in Aquatic Product by QuEChERS Combined with UPLC – MS/MS**

GONG Xiao-ming, HUA Meng-meng, WANG Hong-tao, WANG Bing-jun, MA Rong-hui

UPLC-MS/MS

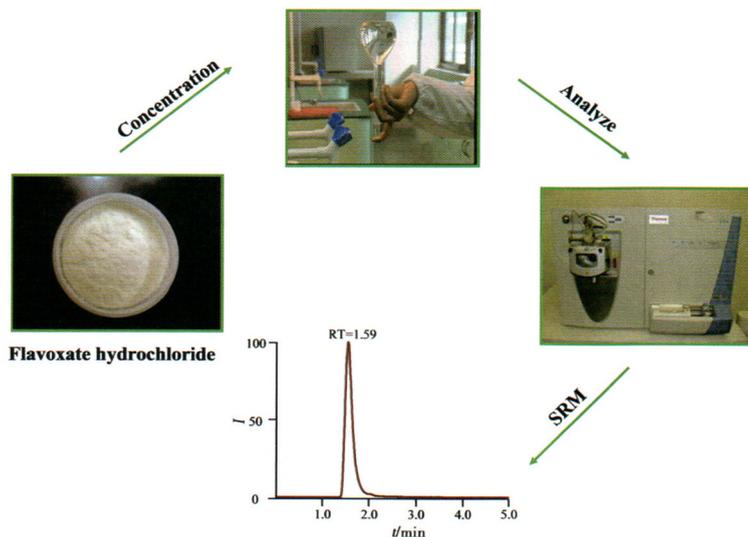
*J. Instrum. Anal.* , 2017, 36(7) : 897 – 901.  
doi: 10.3969/j.issn.1004-4957.2017.07.010



**Rapid Detection of Theophylline Illegally Mixed in Traditional Chinese Medicine by MIP – SERS**

HU Ran, LU Feng, BIAN Xiao-hong, XU Ji-yang

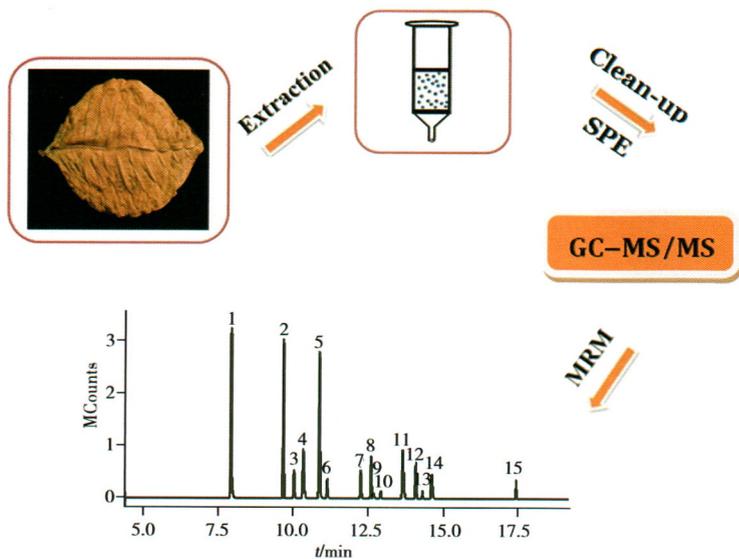
*J. Instrum. Anal.* , 2017, 36(7) : 902 – 905.  
doi: 10.3969/j.issn.1004-4957.2017.07.011



### Determination of 1-(2-Hydroxyethyl) piperidine in Flavoxate Hydrochloride by HPLC – QTRAP – MS/MS

XU Jie, ZHOU Chang-peng, ZHENG Wen-feng, WANG Chun-ling

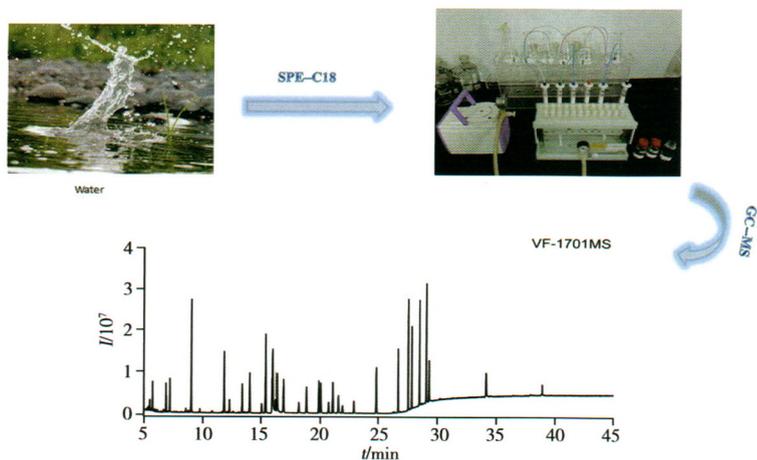
*J. Instrum. Anal.* , 2017, 36(7) : 906 – 910.  
doi: 10.3969/j. issn. 1004 – 4957. 2017. 07. 012



### Determination of 15 Kinds of Phenoxyacid Herbicides in Tobacco by Gas Chromatography – Tandem Mass Spectrometry

CAO Gui-hong, WANG Xing-ning

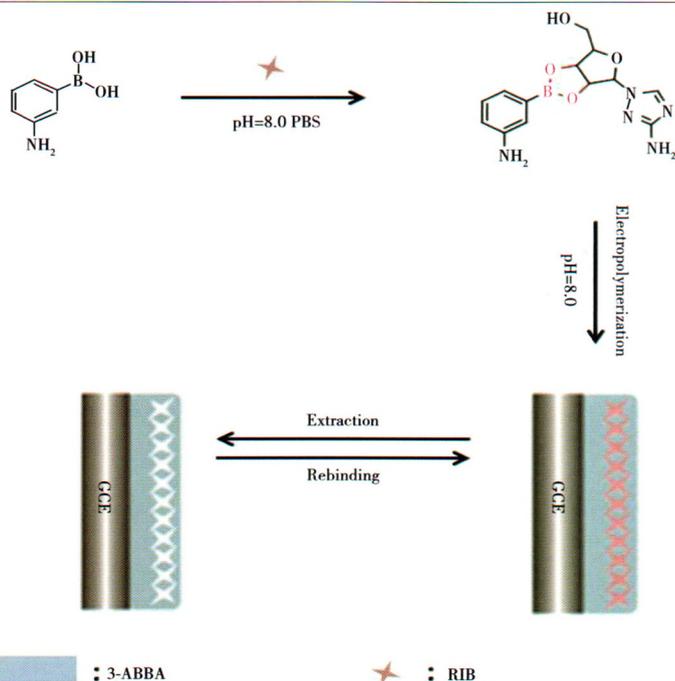
*J. Instrum. Anal.* , 2017, 36(7) : 911 – 915.  
doi: 10.3969/j. issn. 1004 – 4957. 2017. 07. 013



### Simultaneous Determination of 27 Kinds of SVOCs in Water by SPE/GC – MS/SIM

DONG Jun, LIU Tong-zhe, YUAN Peng-hui, YIN Shu-cui

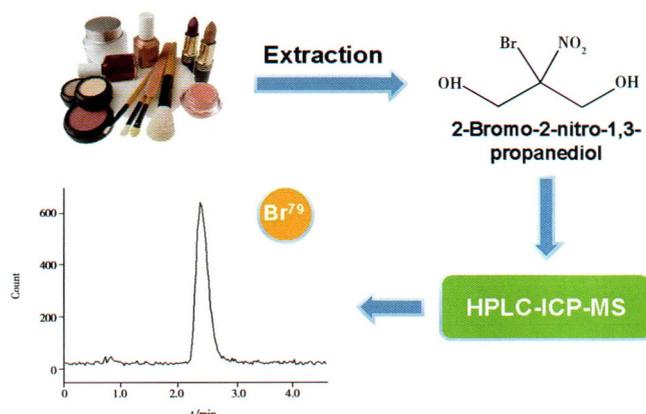
*J. Instrum. Anal.* , 2017, 36(7) : 916 – 920.  
doi: 10.3969/j. issn. 1004 – 4957. 2017. 07. 014



### Development of an Electrochemical Sensor for Detection of Ribavirin Based on In-situ Polymerization Molecularly Imprinted Film

HUA Yan-tao, XU Zhen-lin, WANG Hong, YANG Jin-yi, SUN Yuan-ming, SHEN Yu-dong

*J. Instrum. Anal.*, 2017, 36(7): 921–924.  
doi: 10.3969/j.issn.1004-4957.2017.07.015

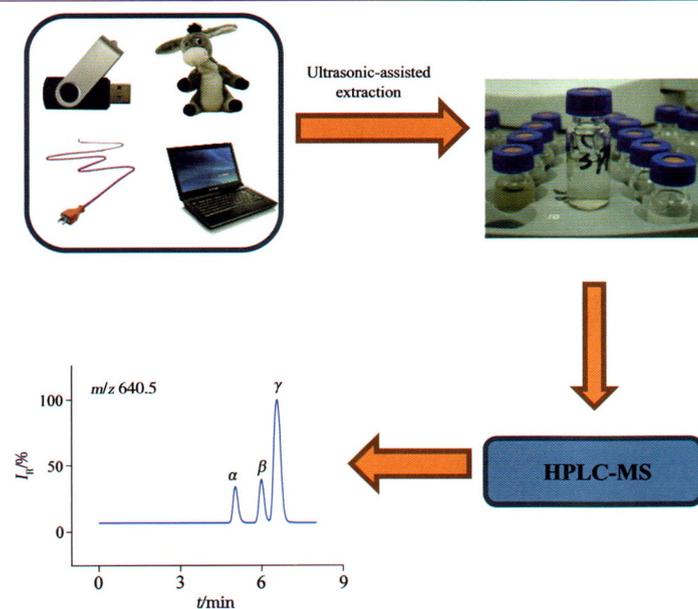


### Determination of 2-Bromo-2-nitro-1, 3-propanediol in Cosmetics by High Performance Liquid Chromatography – Inductively Coupled Plasma Mass Spectrometry

WANG Mei-bo, ZHONG Ji-qiang, CHEN Dandan, MAO Bei-ping, WANG Xin-mei, ZHENG Rong, LIU Chang, WANG Ke

*J. Instrum. Anal.*, 2017, 36(7): 925–928.  
doi: 10.3969/j.issn.1004-4957.2017.07.016

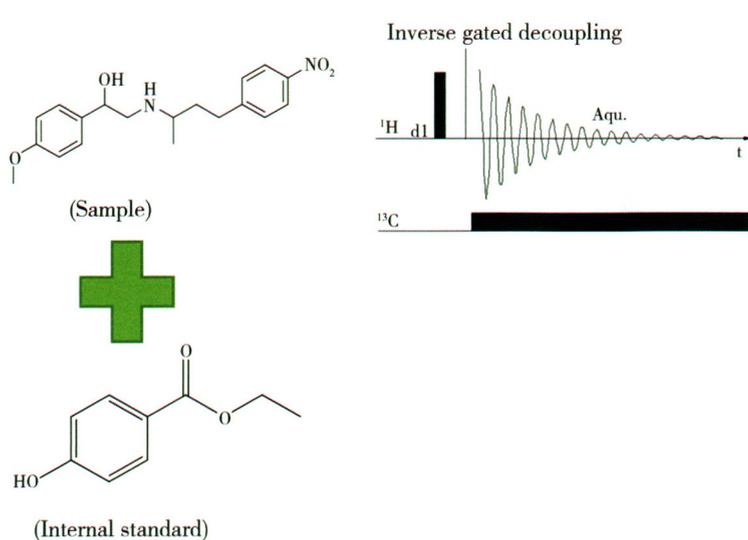
## Experimental Techniques



### Determination of Hexabromocyclododecanes in Polymers of Electrical and Electronic Products Using Ultrasonic Extraction Followed by LC – MS

CHEN Qiong, HUANG Qiu-xin, JIANG Tao, CHOU Tian-shu, FANG Liang, WU Qin

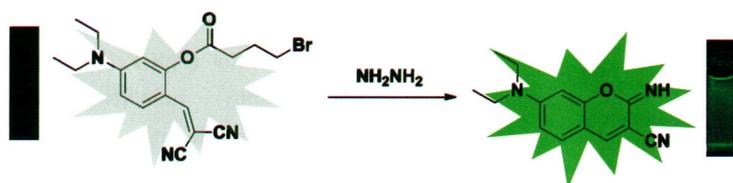
*J. Instrum. Anal.*, 2017, 36(7): 929–932.  
doi: 10.3969/j.issn.1004-4957.2017.07.017



### Application of Inverse Gated Decoupling Technique in Quantitative <sup>1</sup>H NMR Determination of Purity of Phenylethanolamine A

SONG Yin-qing, WANG Min, WANG Tong-tong, ZHOU Jian, YANG Meng-ru

*J. Instrum. Anal.*, 2017, 36(7): 933–936.  
doi: 10.3969/j.issn.1004–4957.2017.07.018

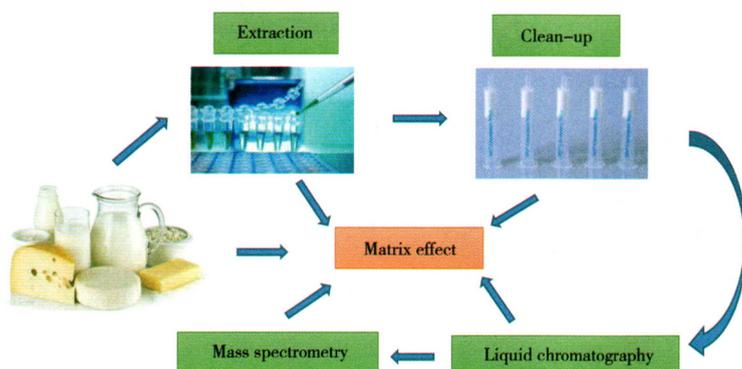


### Synthesis and Application of a Fluorescent Probe for Hydrazine Determination

ZHANG Qi, GAO Chao, LIANG Huan-ru, HOU Peng

*J. Instrum. Anal.*, 2017, 36(7): 937–940.  
doi: 10.3969/j.issn.1004–4957.2017.07.019

## Review



### Research Progress on Liquid Chromatography – Mass Spectrometry Analysis of Multi class Veterinary Drugs Residues in Dairy Products

ZHANG Lu-qi, ZHANG Hong-wei, LIANG Cheng-zhu, ZHANG Xiao-mei, BAO Lei, WANG Pei-feng

*J. Instrum. Anal.*, 2017, 36(7): 941–948.  
doi: 10.3969/j.issn.1004–4957.2017.07.020

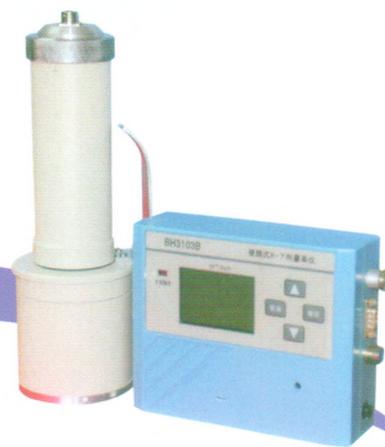


# 中核控制系统工程有限公司

CHINA NUCLEAR CONTROL SYSTEM ENGINEERING CO., LTD.



**FD125型氢钍分析器**  
水中镭的国标方法



**BH3103BX-γ 剂量率仪**



**低本底α、β 测量仪**

国标GB/T11628-2008低本底仪器起草单位，  
30年的制造经验代表着稳定、可靠、完美



**热释光测量仪**



**BH3105型中子剂量当量仪**

## 中核广东省广西总代理



地址：广州市天河区天润路37-39号润华大厦403 电话：020-38490225 38492937 38492927  
传真：020-38492985 邮箱：y\_tongxing@126.com 网址：www.yitongxing.cn