

# Briefs

## Evaluation of the Basal Plane of Pyrolytic Graphite as an Electrochemical Detector for Liquid Chromatography

1410

Anodic oxidation of pressure-annealed pyrolytic graphite provides a versatile detector for liquid chromatography with electrochemical detection. Detector performance is demonstrated for oxidations and reductions.

**R. M. Wightman,\* E. C. Paik, S. Borman, and M. A. Dayton,** Department of Chemistry, Indiana University, Bloomington, Ind. 47401  
*Anal. Chem.*, 50 (1978)

## Evaporative Analyzer as a Mass Detector for Liquid Chromatography

1414

The calibration curve for the detector's response is shown to be nearly linear for solute concentrations in the range of  $1 \times 10^{-4}$  to  $1.5 \times 10^{-3}$  g cm $^{-3}$  for normal atomization air pressure.

**John M. Charlesworth,** Department of Industrial Science, University of Melbourne, Victoria, Australia  
*Anal. Chem.*, 50 (1978)

## Separation of the Citric Acid Cycle Acids by Liquid Chromatography

1420

Separation is achieved without prior derivatization and only minimal sample preparation. Detection limits are as low as 1 ppm for some acids.

**V. T. Turkelson and Milton Richards,\*** Analytical Laboratories, The Dow Chemical Company, Midland, Mich. 48640  
*Anal. Chem.*, 50 (1978)

## Effect of Concentration on the Internal Standards Method in Gas-Liquid Chromatography

1423

A system of analyte and standard is presented, in which the peak-area ratio is a complicated function of concentration and of the volume injected into the column.

**Adam Shatkay,** Israel Institute for Biological Research, Ness-Ziona, Israel  
*Anal. Chem.*, 50 (1978)

## Isolation of Polycyclic Organic Compounds by Solvent Extraction with Dimethyl Sulfoxide

1429

A liquid-liquid extraction procedure using dimethyl sulfoxide selectively and rapidly removes polycyclic organic matter from aliphatic hydrocarbons in environmental samples.

**D. F. S. Natusch,\*** Department of Chemistry, Colorado State University, Fort Collins, Colo. 80523, and **B. A. Tomkins,** School of Chemical Sciences, University of Illinois, Urbana, Ill. 61801  
*Anal. Chem.*, 50 (1978)

## Determination of Triphenyltin Hydroxide and Its Degradation Products in Water

1435

Levels of 0.01  $\mu\text{g}/\text{mL}$  or less are detected using an electron-capture gas-liquid chromatography procedure.

**Charles J. Soderquist and Donald G. Crosby,\*** Department of Environmental Toxicology, University of California, Davis, Calif. 95616  
*Anal. Chem.*, 50 (1978)

## Titration of Diprotic Acids in Alcohols and Intramolecular Hydrogen Bonding in Monoanions with Emphasis on Isopropanol and *tert*-Butanol

1440

Dissociation and intramolecular hydrogen bond formation constants are calculated for malonic, succinic, maleic, and o-phthalic acids and their methyl esters.

**I. M. Kolthoff\*** and **M. K. Chantooni, Jr.,** Department of Chemistry, University of Minnesota, Minneapolis, Minn. 55455  
*Anal. Chem.*, 50 (1978)

## In-Flame Gas-Solid Interactions for Simultaneous Determination of Iodide and Bromide on the Parts-per-Billion Level

1446

The analytical range extends from 2 to  $10^3$  ppb I and from 5 to  $10^4$  ppb Br.

**R. S. Fike and C. W. Frank,\*** Department of Chemistry, University of Iowa, Iowa City, Iowa 52242  
*Anal. Chem.*, 50 (1978)

## Gas Chromatograph-Microwave Plasma Detector for the Determination of Tetraalkyllead Species in the Atmosphere

1449

The effects of background correction using wavelength modulation techniques, doping gases, collection efficiency, and break-through volume are discussed.

**D. C. Reamer, W. H. Zoller,\* and T. C. O'Haver,** Department of Chemistry, University of Maryland, College Park, Md. 20742  
*Anal. Chem.*, 50 (1978)

## Pulsed Radio-Frequency Electrodeless Discharge Lamps for Atomic Absorption and Atomic Fluorescence Spectrometry

1453

The pulsed lamps generally provide higher sensitivity in both absorption and fluorescence measurements for Zn, Cd, and Hg.

**John W. Novak, Jr. and Richard F. Browner,\*** School of Chemistry, Georgia Institute of Technology, Atlanta, Ga. 30332  
*Anal. Chem.*, 50 (1978)

## Performance Characteristics of a Vidicon-Based Spectrometer with an Autoranging Amplifier

1458

A combination of the two instruments improves the S/N and extends the linear dynamic range by more than one absorbance unit in some regions of the spectrum.

**Ronald M. Hoffman and Harry L. Pardue,\*** Department of Chemistry, Purdue University, West Lafayette, Ind. 47907  
*Anal. Chem.*, 50 (1978)

\* Corresponding author.

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## Determination of Chenodeoxycholic Acid and Ursodeoxycholic Acid by Nuclear Magnetic Resonance Spectrometry 1462

The procedures for identification and purity determination (std dev 0.3%) described in this paper provide an efficient alternative to nonspecific conventional techniques of separation and titration.

**Pranab K. Bhattacharyya\*** and **Yakub G. Bankawala**, Quality Control Department, Hoffmann-La Roche Inc., Nutley, N.J. 07110  
*Anal. Chem.*, 50 (1978)

## Isotope-Ratio-Monitoring Gas Chromatography-Mass Spectrometry 1465

$^{13}\text{C}/^{12}\text{C}$  and  $^{15}\text{N}/^{14}\text{N}$  ratios are measured with a relative standard deviation of better than 0.5% on samples as small as  $10^{-8}$  mol C and  $10^{-7}$  mol N.

**D. E. Matthews** and **J. M. Hayes,\*** Departments of Chemistry and Geology, Indiana University, Bloomington, Ind. 47401  
*Anal. Chem.*, 50 (1978)

## Determination of Polychlorinated Dibenz-p-dioxins in Biological Samples by Negative Chemical Ionization Mass Spectrometry 1474

Various negative chemical ionization techniques offer increased sensitivity and/or specificity for polychlorodibenz-p-dioxins determination.

**J. R. Hass,\* M. D. Friesen, D. J. Harvan, and C. E. Parker**, Environmental Biology and Chemistry Branch, National Institute of Environmental Health Sciences, P.O. Box 12233, Research Triangle Park, N.C. 27709  
*Anal. Chem.*, 50 (1978)

## Simultaneous Determination of Arsenic, Antimony, Cadmium, Chromium, Copper, and Selenium in Environmental Material by Radiochemical Neutron Activation Analysis 1479

The simplicity of the method permits a rapid isolation of the radioisotopes of interest without many chemical steps.

**M. Gallorini, R. R. Greenberg, and T. E. Gills,\*** Center for Analytical Chemistry, National Bureau of Standards, Washington, D.C. 20234  
*Anal. Chem.*, 50 (1978)

## Lysine Specific Enzyme Electrode for Determination of Lysine in Grains and Foodstuffs 1481

The electrodes are stable, with a linear range of L-lysine concentration of  $5 \times 10^{-5}$ - $10^{-1}$  M.

**W. Claude White and George G. Gullbault,\*** Department of Chemistry, University of New Orleans, New Orleans, La. 70122  
*Anal. Chem.*, 50 (1978)

## Chemically Modified Polymer Electrodes: Synthetic Approach Employing Poly(methacryl chloride) Anchors 1487

Hydroxylmethylferrocene is attached to an  $\text{SnO}_2$  electrode surface via polymer chains. Symmetric, persistent, and voltammetric waves are observed.

**Kingo Itaya and Allen J. Bard,\*** Department of Chemistry, The University of Texas at Austin, Austin, Tex. 78712  
*Anal. Chem.*, 50 (1978)

## Current-Potential-Time Relationships in Differential Pulse Polarography: Theory of Reversible, Quasireversible, and Irreversible Electrode Processes 1489

A rigorous theoretical treatment is given for three types of electron transfer processes. Methods for the determination of kinetic parameters are suggested.

**Ronald L. Birke**, Department of Chemistry, City University of New York, The City College, New York, N.Y. 10031  
*Anal. Chem.*, 50 (1978)

## Rapid Scan Alternate Drop Pulse Polarographic Methods 1496

A number of alternate drop waveforms to compensate for charging current at the dropping mercury electrode are applied to the voltammetric methods.

**John A. Turner and R. A. Osteryoung,\*** Department of Chemistry, Colorado State University, Fort Collins, Colo. 80523  
*Anal. Chem.*, 50 (1978)

## Polymer-Bound Thiol for Detection of Disulfides in Liquid Chromatography Eluates 1500

The thiol-disulfide interchange in a short thiol-Sepharose column is the basis of a sensitive method for detecting disulfides in LC eluates.

**J. F. Studebaker\* and S. A. Slocum**, IBM—Thomas J. Watson Research Center, Yorktown Heights, N.Y. 10598, and **E. L. Lewis**, Mount Holyoke College, South Hadley, Mass.  
*Anal. Chem.*, 50 (1978)

## Chromatography of Metal Ions with a Thioglycolate Chelating Resin 1504

The synthesis and properties of a new chelating thioglycolate resin are reported.

**Richard J. Phillips\*** and **James S. Fritz**, Ames Laboratory—Department of Energy and Department of Chemistry, Iowa State University, Ames, Iowa 50011  
*Anal. Chem.*, 50 (1978)

## Synthesis of *N,N'*-Bis(*p*-butoxybenzylidene)- $\alpha,\alpha'$ -bi-*p*-toluidene and *N,N'*-Bis(*p*-phenylbenzylidene)- $\alpha,\alpha'$ -bi-*p*-toluidine and Their Comparison with Dexsil 300 for Polycyclic Aromatic Hydrocarbon Separations

1508

A modified synthesis, purification, column coating technique, and GC properties of these liquid crystals are reported.

**John W. Strand and Anders W. Andren,\*** Water Chemistry Program, University of Wisconsin—Madison, Madison, Wis. 53706  
*Anal. Chem.*, 50 (1978)

## Influence of Instrumental Contributions on the Apparent Column Efficiency in High Speed Gas Chromatography

1512

An extended form of the plate height equation is developed to test the performance of a high speed chromatographic system.

**GYULA GASPAR**, Polytechnical University, Department of Physical Chemistry, Budapest, Hungary; **RAYMOND ANNINO**, Chemistry Department, Canisius College, Buffalo, N.Y. 14208, and **CLAIRE VIDAL-MADJAR and GEORGES GUIOCHON,\*** Ecole Polytechnique, Laboratoire de Chimie Analytique Physique, Route de Saclay-91128, Palaiseau Cedex, France  
*Anal. Chem.*, 50 (1978)

## Computer Separation of Infrared Spectra for Analysis of Complex Organic Mixtures

1518

A computerized dispersive infrared spectrometer is developed for the qualitative and quantitative analysis of individual components in a complex organic mixture.

**P. F. Lynch\*** and **M. M. Brady**, Department of Chemistry, University of Rhode Island, Kingston, R.I. 02881  
*Anal. Chem.*, 50 (1978)

## Signal Number Prediction in Carbon-13 Nuclear Magnetic Resonance Spectrometry

1522

A computer program predicts the number of signals expected in the broad-band decoupled  $^{13}\text{C}$  NMR spectrum of a compound from the molecule's graph.

**Craig A. Shelley and Morton E. Munk,\*** Department of Chemistry, Arizona State University, Tempe, Ariz. 85281  
*Anal. Chem.*, 50 (1978)

## Automated Separation and Conductimetric Determination of Ammonia and Dissolved Carbon Dioxide

1528

Automated ammonia determinations in biological samples after Kjeldahl digestion are reported.

**Robert M. Carlson**, Department of Pomology, University of California, Davis, Calif. 95616  
*Anal. Chem.*, 50 (1978)

## Membrane Electrode Measurement of Lysozyme Enzyme Using Living Bacterial Cells

1531

The strain *Micrococcus lysodeikticus* is employed as a substrate to determine lysozyme activity.

**Paul D'Orazio, M. E. Meyerhoff, and G. A. Rechnitz,\*** Department of Chemistry, University of Delaware, Newark, Del. 19711  
*Anal. Chem.*, 50 (1978)

## Computer Controlled Bipolar Pulse Conductivity System for Applications in Chemical Rate Determinations

1534

A conductance instrument is capable of high accuracy, high precision, and high speed. The instrument's utility is demonstrated by stopped-flow experiments.

**K. J. Caserta**, Ivorydale Technical Center, The Procter and Gamble Company, Cincinnati, Ohio 45217, **F. J. Holler,\*** Department of Chemistry, University of Kentucky, Lexington, Ky. 40506, and **S. R. Crouch and C. G. Enke**, Department of Chemistry, Michigan State University, East Lansing, Mich. 48824  
*Anal. Chem.*, 50 (1978)

## N-Methylimidazole as a Catalyst for Analytical Acetylations of Hydroxy Compounds

1542

*N*-Methylimidazole has a catalytic activity 400 times greater than pyridine. The mechanism of catalysis is discussed.

**Kenneth A. Connors\*** and **Nivedita K. Pandit**, School of Pharmacy, University of Wisconsin, Madison, Wis. 53706  
*Anal. Chem.*, 50 (1978)

## Vacuum Sublimation Behavior of Various Metal Chelates of 4-Anilino-3-pentene-2-one, Acetylacetone, Dithiocarbamates, Oxine and Its Derivatives, Dimethylglyoxime, Dithizone, 1-(2-Pyridylazo)-2-naphthol, and Tetraphenylporphyrin

1545

A vacuum sublimation apparatus with continuous temperature gradient (30–320 °C) along its length (0–65 cm) is described.

**Takaharu Honjo,\* Hisanori Imura, Shigeki Shima, and Toshiyasu Koba**, Department of Chemistry, Faculty of Science, Kanazawa University, Marunouchi, Kanazawa, Ishikawa 920, Japan  
*Anal. Chem.*, 50 (1978)

## Determination of Vanadium in Biological Materials by Radiochemical Neutron Activation Analysis

1553

A procedure for separating V prior to neutron activation is compared to a procedure where the separation is made after the irradiation.

**Ralph O. Allen and Eiliv Steinnes,\*** Institutt for Atomenergi, Isotope Laboratories, Kjeller, Norway  
*Anal. Chem.*, 50 (1978)

## Determination of Trace Elements on Small Geological Samples Fused in Lithium Tetraborate with X-Ray Fluorescence Spectrometry

1555

Rb, Sr, Y, Zr, and Nb are determined on 100-mg samples. The accuracy is about 5% for concentrations down to 100 ppm and 10% between 100 and 20 ppm.

**Emil Jagoutz and Christi Palme,\*** Max-Planck-Institut für Chemie (Otto-Hahn-Institut), Abteilung Kosmochemie, Saarstrasse 23, 6500 Mainz, Federal Republic of Germany  
*Anal. Chem.*, 50 (1978)

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## Radiochemical Determination of Protactinium-231 in Environmental and Biological Materials 1559

The value obtained for protactinium-231 by  $\alpha$  spectrometry is  $261 \pm 2$  dpm/g, which statistically agrees with the theoretical value.

Claude W. Sill, Radiological and Environmental Sciences Laboratory, Department of Energy, Idaho Falls, Idaho 83401

*Anal. Chem.*, 50 (1978)

## Statistical Analysis of Titration Data 1571

A calculational procedure is described by which acid dissociation constants, the equivalence point volume, and the pH meter calibration setting are extracted from pH potentiometric titration data.

Lowell M. Schwartz\* and Robert I. Gelb, Department of Chemistry, University of Massachusetts, Boston, Mass. 02125

*Anal. Chem.*, 50 (1978)

## Correspondence

### Matrix Effect on the Lifetime of Room-Temperature Phosphorescence 1577

Gary J. Niday and Paul G. Seybold,\* Department of Chemistry, Wright State University, Dayton, Ohio 45435

*Anal. Chem.*, 50 (1978)

### Surface Treatment for Chromatographic Packings: Attachment of Tetrachloroterephthaloyl Half Esters 1578

Stanley H. Langer,\* Daniel T. Hein, and Mark W. Bolme, Chemical Engineering Department, University of Wisconsin, Madison, Wis. 53706

*Anal. Chem.*, 50 (1978)

### Comment on the Application of Feature Selection Method for Binary Coded Patterns 1580

Yoshikatsu Miyashita, Hidetsugu Abe, and Shin-ichi Sasaki,\* Miyagi University of Education Aoba, Sendai, 980 Japan, and Kohtaro Yuta, Pharmaceutical Institute Tohoku University, Aoba, Sendai, 980 Japan

*Anal. Chem.*, 50 (1978)

## Multiple Regression Function Correlating the Red Shift of an Organometallic Chromophore with Donor Basicity in Nonaqueous Media 1581

Orland W. Kolling, Chemistry Department, Southwestern College, Winfield, Kan. 64156

*Anal. Chem.*, 50 (1978)

## Equivalence of Simultaneous Scanning and Three-Dimensional Plotting of Fluorescence Spectra 1583

Eugene R. Weiner, Department of Chemistry, University of Denver, Denver, Colo. 80210

*Anal. Chem.*, 50 (1978)

## Comments on Determination of Fluorine in Petroleum and Petroleum Process Catalysts with a Fluoride Electrode 1584

J. N. Wilson\* and C. Z. Marcewski, The British Petroleum Company Limited, BP Research Centre, Chertsey Road, Sunbury-on-Thames, Middlesex TW16 7LN, England

## Exchange of Comments: Analysis of Complex Volatile Mixtures by a Combined Gas Chromatography-Mass Spectrometry-Computer System 1585

Dennis H. Smith,\* William J. Yeager, and Thomas C. Rindfleisch, Department of Genetics, Stanford University School of Medicine, Stanford, California 94305, and Charles C. Sweeley,\* Stephen C. Gates, and John F. Holland, Department of Biochemistry, Michigan State University, East Lansing, Mich. 48824

*Anal. Chem.*, 50 (1978)

## Chlorinated Benzyl Phenyl Ethers: A Possible Interference in the Determination of Chlorinated Dibenzo-p-Dioxins in 2,4,5-Trichlorophenol and Its Derivatives 1586

L. A. Shadoff,\* W. W. Blaser, and C. W. Kocher, The Dow Chemical Company, Analytical Laboratories, Midland, Mich. 48640, and H. G. Fravel, The Dow Chemical Company, Organic Chemicals Research Lab, Midland, Mich. 48640

*Anal. Chem.*, 50 (1978)

## Aids for Analytical Chemists

### Cell for Isoextraction Studies and Determination of Some Acid Dissociation Constants 1589

Pasupati Mukerjee\* and Yoshiaki Moroi, School of Pharmacy, University of Wisconsin—Madison, Madison, Wis. 53706

*Anal. Chem.*, 50 (1978)

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<b>Determination of Terminal Thiol Groups in Sulfur Polymers by Laser Raman Spectrometry</b>	<b>1591</b>
Samir K. Mukherjee,* Gary D. Guenther, and Arun K. Bhattacharya, Hooker Chemicals & Plastics Corp., Research Center, Grand Island, N.Y. 14072	<i>Anal. Chem.</i> , 50 (1978)
<b>Alternative Method of Analyzing First-Order Kinetic Data</b>	<b>1592</b>
Lowell, M. Schwartz* and Robert I. Gelb, Department of Chemistry, University of Massachusetts, Boston, Mass. 02125	<i>Anal. Chem.</i> , 50 (1978)
<b>Direct Reduction of Sulfates to Sulfur Dioxide for Isotopic Analysis</b>	<b>1594</b>
Max L. Coleman* and Michael P. Moore, Institute of Geological Sciences, Geochemical Division, 64 Gray's Inn Road, London WC1X 8NG, England	<i>Anal. Chem.</i> , 50 (1978)
<b>Direct Determination of Chlorite Ion in the Presence of Excess Hypochlorite Ion</b>	<b>1596</b>
Kazunori Suzuki and Gilbert Gordon; Department of Chemistry, Miami University, Oxford, Ohio 45056	<i>Anal. Chem.</i> , 50 (1978)
<b>Sequential Hollow Cathodes for Background Correction in Atomic Absorption Spectrometry</b>	<b>1597</b>
Donald A. Bath, John R. Amend, and Ray A. Woodriff,* Department of Chemistry, Montana State University, Bozeman, Mont. 59715	<i>Anal. Chem.</i> , 50 (1978)
<b>Supplementary Information for "Reagent Chemicals", 5th Edition</b>	<b>1600</b>
<b>Correction. Interferometric Concentration Determination of Dextran after Gel Chromatography.</b> Lars Hagel	1600
<b>Correction. Flow Photometric Monitor for Uranium in Carbonate Solutions.</b> B. B. Jablonski and D. E. Leyden	1600

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