

Journal of Agricultural and Food Chemistry

JULY/AUGUST 1973

- 511 A Century of DDT
Robert L. Metcalf
- 520 Symposium on Non-Vapor Phase Techniques for Isolation and Identification of Flavor Compounds
Michael E. Mason
- 521 Applications of Laser Raman Spectroscopy to Natural Products Research
Stanley K. Freeman
- 526 Application of Infrared Fourier Transform Spectroscopy to Analysis of Micro Samples
Stanley S. T. King
- 531 High-Pressure Liquid Chromatography in the Separation and Detection of Bitter Compounds
Russell J. Molyneux and Yen-i Wong*
- 535 Bitter Tasting Compounds of Beer. Chemistry and Taste Properties of Some Hop Resin Compounds
Suryanarayana R. Palamand and Jeanne M. Aldenhoff*
- 544 Comparison of Gas-Liquid, Gas-Solid, Liquid-Liquid, and Liquid-Solid Chromatographic Techniques in Analysis of Vanillin and Ethyl Vanillin in Alcoholic Solutions
Glenn E. Martin, G. Gale Guinand, and Donald M. Figert*
- 547 Liquid Chromatography Applications in Analysis and Quality Control of Flavor Chemicals
John P. Walradt and Chi-Kuen Shu*
- 551 Applications of Combined Gel Permeation Chromatography and High Speed Liquid Chromatography for the Separation of Complex Flavor Mixtures
John A. Schmit, Reed C. Williams, and Richard A. Henry*
- 556 Automated Colorimetric Measurement of Free Arginine in Peanuts as a Means to Evaluate Maturity and Flavor
Clyde T. Young
- End of Symposium
- 559 Symposium on Biogenesis of Flavor Components
James K. Palmer
- 560 Biogenesis of Banana Volatiles
Roland Tressl and Friedrich Drawert*

VOL. 21, NO. 4 © COPYRIGHT 1973 BY THE AMERICAN CHEMICAL SOCIETY

EDITOR: PHILIP K. BATES
363 17th Street
Santa Monica, Calif. 90402

ADVISORY BOARD

J. C. Bauernfeind,
Malcolm C. Bowman,
C. O. Chichester,
Phillip Issenberg,
Constance Kies,
L. M. Libbey,
J. K. Loosli,
R. E. Menzer,
C. W. Stanley,
Roy Teranishi,
Gilbert L. Terman,
A. E. Wasserman

EDITORIAL HEADQUARTERS
1155 16th Street, N.W.
Washington, D. C. 20036
Phone 202-872-4600
Teletype 710-8220151

MANUSCRIPT REVIEWING

Associate Editor: Norma Yess

EDITORIAL PROCESSING
DEPARTMENT
20th and Northampton Sts.
Easton, Pa. 18042

Senior Production Editor:
Marianne C. Brogan

Editorial Assistant: Arlene Koch

Published by the
AMERICAN CHEMICAL SOCIETY
1155 16th Street, N.W.
Washington, D. C. 20036

BOOKS AND JOURNALS
DIVISION

John K. Crum Director
Ruth Reynard Assistant to the
Director

Charles R. Bertsch Head, Editorial
Processing Department
D. H. Michael Bowen Head,
Journals Department
Bacil Guiley Head, Graphics and
Production Department
Seldon W. Terrant Head, Research
and Development Department

- 661 Determination of Organic Acids in Tall Fescue (*Festuca arundinacea*) by Gas-Liquid Chromatography
*Richardo L. Boland and George B. Garner**
- 665 Free Fatty Acid Content of Cacao Beans Infested with Storage Fungi
Arthur P. Hansen, Ronald E. Welty, and Rong-sen Shen*
- 670 Several Compounds in Golden Delicious Apples as Possible Parameters of Acceptability
Natalio Gorin
- 673 Identification of Volatile Compounds from Heated L-Cysteine-HCl/D-Glucose
Richard A. Scanlan, Stanley G. Kayser, Leonard M. Libbey, and Max E. Morgan*
- 676 Red Pigment Produced by the Oxidation of L-Scorbamic Acid
Tadao Kurata, Masao Fujimaki, and Yosito Sakurai*
- 681 New Statistical Approach to Evaluation of Lemon Juice
Carl E. Vandercook, Bruce E. Mackey, and Ruth L. Price*
- 684 Irradiated Strawberries—Chemical, Cytogenetic, and Antibacterial Properties
Jack Schubert, Edward B. Sanders, Sylvia F. Pan, and Niel Wald*
- 692 Relationship between Tannin Levels, Rat Growth, and Distribution of Proteins in Sorghum
*Ramamurthi Jambunathan and Edwin T. Mertz**
- 697 Protein, Lysine, and Grain Yields of Triticale and Wheat as Influenced by Genotype and Location
Joseph E. Ruckman, Frederick P. Zscheile, Jr., and Calvin O. Qualset*
- 700 The System $\text{NH}_3\text{-K}_2\text{O-H}_3\text{PO}_4\text{-H}_4\text{P}_2\text{O}_7\text{-H}_2\text{O}$ at 25°
A. William Frazier, Ewell F. Dillard, Raymond D. Thrasher, and Kjell R. Waerstad*
- 705 Acidic Ammonium Polyphosphate Fertilizer as Carriers for Manganese
Lloyd R. Hossner and Jerry A. Freeouf*
- 708 Transformation of Dicamba in Regina Heavy Clay
Allan E. Smith
- 711 Microdetermination of Chloro-s-triazines in Soil by Gas-Liquid Chromatography with Nickel Electron Capture or Electrolytic Conductivity Detection
Hong Y. Young and Ada Chu*
- 714 Organoleptic Properties of Some Alkyl-Substituted Alkoxy- and Alkylthiopyrazines
■ *Thomas H. Parliment* and Martin F. Epstein*
- 716 Quantitative Isolation and Partial Characterization of Elastin in Bovine Muscle Tissue
H. Russell Cross, Gary C. Smith, and Zerle L. Carpenter*
- 721 Oxidation of Sodium [$\text{U-}^{14}\text{C}$]Palmitate into Carbonyl Compounds by *Penicillium roqueforti* Spores
*Clemence K. Dartey and John E. Kinsella**
- 727 The Biochemistry of Tea Fermentation: Oxidative Degallation and Epimerization of the Tea Flavanol Gallates
*Philip Coggon, Gerald A. Moss, Harold N. Graham, and Gary W. Sanderson**
- 734 Radioisotope Residues and Residues of Dichlorvos and Its Metabolites in Pregnant Sows and Their Progeny Dosed with Dichlorvos- ^{14}C or Dichlorvos- ^{36}Cl Formulated as PVC Pellets
John C. Potter, Alvin C. Boyer, Ronald L. Marxmiller, Robert Young, and Josef E. Loeffler*

COMMUNICATIONS

- 738 Identification of 2,4,6-Trichloroanisole in Several Essential Oils
J. Stoffelsma and K. B. de Roos*

Published bimonthly by the American Chemical Society, from 20th and Northampton Sts., Easton, Pa. 10842. Executive Offices, Editorial Headquarters, and Subscription Service Department, 1155 Sixteenth St., N.W., Washington, D. C. 20036. Correspondence regarding accepted papers, proofs, and reprints should be directed to Editorial Processing Department, American Chemical Society, 20th and Northampton Sts., Easton, Pa. 18042. Advertising Office: 142 East Avenue, Norwalk, Conn. 06851. *Journal of Agricultural and Food Chemistry* and other ACS periodicals are available on microfilm. For information write to: MICROFILM, Special Issues Sales, American Chemical Society, 1155 Sixteenth St., N.W., Washington, D. C. 20036. Second-class postage paid at Washington, D. C., and at additional mailing offices.

The American Chemical Society assumes no responsibility for the statements and opinions advanced by contributors to its publications.

Guide for Authors appears on pages 5A and 6A of the March/April issue. Manuscript (3 copies) should be submitted to Manuscript Reviewing, J. Agr. Food Chem., 1155 Sixteenth St., N.W., Washington, D. C. 20036.

SUBSCRIPTION SERVICE: Send all new and renewal subscriptions with payment to: Office of the Controller, 1155 16th Street, N.W., Washington,

D. C. 20036. Subscriptions should be renewed promptly to avoid a break in your series. All correspondence and telephone calls regarding changes of address, claims for missing issues, subscription service, the status of records, and accounts should be directed to: Manager, Membership and Subscription Services, American Chemical Society, P.O. Box 3337, Columbus, Ohio 43210. Telephone (614) 421-7230. On changes of address, include both old and new addresses with ZIP code numbers, accompanied by mailing label from a recent issue. Allow four weeks for change to become effective. Claims for missing numbers will not be allowed (1) if loss was due to failure of notice of change in address to be received before the date specified above, (2) if received more than sixty days from date of issue plus time normally required for postal delivery of journal and claim, or (3) if the reason for the claim is "issue missing from files."

SUBSCRIPTION RATES 1973: Members, domestic and foreign, 1 year \$10.00; nonmembers, domestic and foreign, \$30.00. Those interested in becoming members should write to the Admissions Department, American Chemical Society, 1155 Sixteenth St., N.W., Washington, D. C. 20036. Postage: Canada and Pan-American Union, \$3.50; foreign, \$4.00. Single copies current issues, \$6.00. Rates for back issues or volumes are available from Special Issues Sales Dept., 1155 16th St., N.W., Washington, D. C. 20036.