

Rocky Mountain Conference on Magnetic Resonance


Volume 34 *34th Rocky Mountain Conference on Applied Spectroscopy*

Article 1

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34th Rocky Mountain Conference on Applied Spectroscopy

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34th Rocky Mountain Conference on Applied Spectroscopy

Abstract

Program and registration information for the 34th annual meeting of the Rocky Mountain Conference on Applied Spectroscopy, co-sponsored by the Colorado Section of the American Chemical Society and the Rocky Mountain Section of the Society for Applied Spectroscopy. Held in Denver, Colorado, August 2-6, 1992.

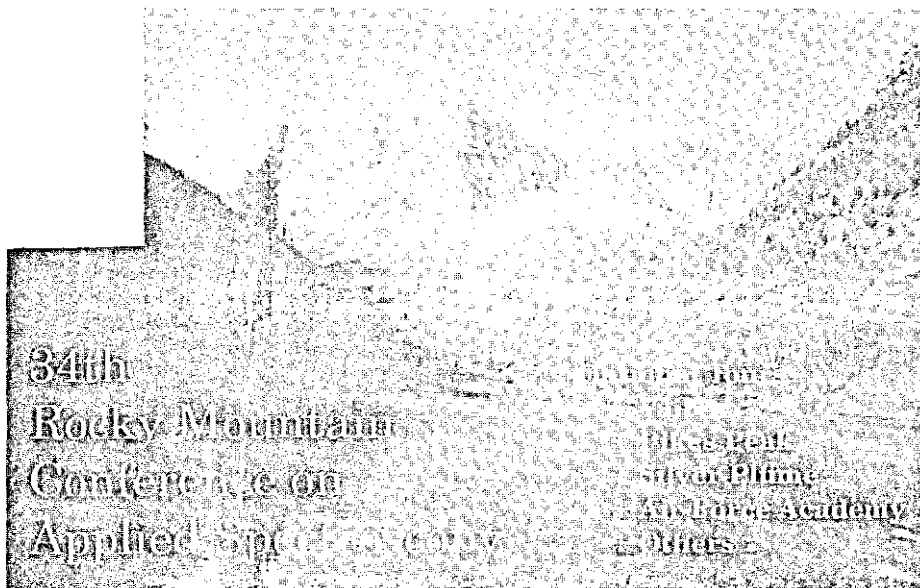
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PROGRAM
AND
REGISTRATION INFORMATION

AUGUST 2-6, 1992

**RADISSON HOTEL DENVER
1550 COURT PLACE
DENVER, COLORADO**

SPONSORED BY

ROCKY MOUNTAIN SECTION
SOCIETY FOR APPLIED SPECTROSCOPY
COLORADO SECTION
AMERICAN CHEMICAL SOCIETY

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SYMPOSIA SCHEDULE
(page number in program)

Symposium	8/3/1992		8/4/1992		8/5/1992		8/6/1992	
	MONDAY		TUESDAY		WEDNESDAY		THURSDAY	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
Atomic Spectroscopy			26	27				
Chromatography			28					
Electrochemistry	29	30						
Elect. Paramag. Res.	36	37	38	39-43	44	44-47	48	49
Environmental	31	32,33	34	35	54			
FTIR/IT/RAMAN	49,50	51						
Hazardous Waste			52	53	54			
ICP-Mass Spec						55		
Lab Total Qual. Mangt	72	73						
Luminescence	56	57						
Mass Spectrometry	58	59	59	60				
NMR	61	62	63	64	65	66-67	68	
Pharmaceutical					69	70		
Quality Assurance			70	71	72	73		
Robotics					74			
Posters	74	75						

Dear Colleagues:

I invite you to attend the 34th Rocky Mountain Conference the first week in August of this year. This conference is a lively one, which prides itself on being able to maintain an air of informality. Technical presentations are as up to date as today's laboratory experiments. New ideas are welcomed, both from the speakers and the audience. This conference stresses an exchange of ideas between attendees and lecturers.

By way of background information; the 34th Rocky Mountain Conference on Analytical Chemistry is an annual conference which is held at the foot of the Colorado Rockies. The conference offers a wide variety of technical symposia in the area of chemistry and related fields. The symposia range from national to international in scope and attendance. Keynote speakers are featured. Their talks bring together the general discipline direction and establish an atmosphere conducive to scientific information exchange and understanding at the technical symposia presentations.

Featured in this year's program are several panel discussions led by noted experts in a variety of the subject areas. These panel discussions are open exchanges between the audience and the panel and allow for ideas and information to be presented by any interested attendee. A number of special symposia will be presented which cross between disciplines. There will be 13 topical symposia. In every aspect, this conference strives to present a pleasant surrounding and proper atmosphere for a complete scientific meeting. An exhibition of equipment accompanies the symposium. Vendors will demonstrate the most modern instruments available. Vendors also offer low cost or no cost workshops on specific subjects of current interest. At this date 11 workshops are scheduled.

An exciting social program is available featuring tours both inside and outside of Denver. Trips will be available each day to nearby mountain areas. Join us for an exciting technical program and an enjoyable stay in the cool Colorado Rockies.

Marvin C. Goldberg,
Chairman 34th Rocky Mountain Conference
On Analytical Spectroscopy

CONFERENCE TOCATTON

Technical sessions and the exhibition for the 34th Rocky Mountain Conference on Analytical Chemistry will be held in the Radisson Hotel Denver, 1550 Court Place, Denver, Colorado 80202.

REGISTRATION

Admission to all technical sessions, vendor sponsored user's groups and the exhibition is by the name badge for the 34th Rocky Mountain Conference. Pre-registration, using the form in the center of this booklet, is encouraged. The deadline for the receipt of the pre-registration form and full remittance of the conference fees is July 20, 1992. Conference fees are payable by check (denominated in \$ US, only) made payable to the Rocky Mountain Conference.

REGISTRATION FEES - 1992

	<u>Pre-registration</u> (received by 7/20/92)	<u>On Site</u>
Registration (entire conference and exhibition)	\$60.00	\$80.00
Registration (one specified day)	\$35.00	\$45.00
Student Registration (requires ID)	\$25.00	\$35.00
Additional Vendor Registration	\$45.00	\$45.00
Unemployed or Retired Registration	\$25.00	\$35.00
Exhibition only (non-vendor)	\$15.00	\$15.00
Banquet	\$30.00	
Tours (please see page for tour price information)		

REFUNDS

Requests for refunds of conference fees must be received by July 20, 1992.

On-site registration for the 34th Rocky Mountain Conference will be held in the Convention Lobby of the Radisson Hotel Denver during the following hours:

Sunday, August 2	5:00 p.m. - 9:00 p.m.
Monday, August 3	7:30 a.m. - 3:30 p.m.
Tuesday, August 4	7:30 a.m. - 3:30 p.m.
Wednesday, August 5	7:30 a.m. - 3:30 p.m.
Thursday, August 6	8:00 a.m. - 2:30 p.m.

EXHIBITION

The Rocky Mountain Conference exhibition provides an opportunity to see and discuss the latest in analytical instrumentation, supplies, and services. Other activities in the exhibition hall include coffee breaks, mixers and poster sessions.

HOURS

Sunday, August 2	Mixer	7:00 p.m. - 9:00 p.m.
Monday, August 3	Exhibits	9:30 a.m. - 5:00 p.m.
Monday, August 3	Posters	2:00 p.m. - 4:00 p.m.
Monday, August 3	Reception	5:00 p.m. - 7:30 p.m.
Tuesday, August 4	Exhibits	9:30 a.m. - 5:00 p.m.
Wednesday, August 5	Exhibits	9:30 a.m. - 5:00 p.m.

Posters will be set up in the exhibition area Monday morning through Wednesday afternoon. For space or information about the exhibition, contact:

Jim Parker
Schuller International
The Mountain Technical Center
PO Box 625005
Littleton, CO 80162-5005
Telephone (303) 978-5481
Fax (303) 978-5094

The following have reserved space as of March 26, 1992

Air Products and Chemicals	Dionix
Allen Scientific Glassblowing	Micro-Now Instrument Co.
Applied Technical Products	Norell, Inc.
Biotransformation, Inc.	Oxford Instruments
Bruker Instruments, Inc.	Perkin Elmer
CEM Corporation	Puregas-General Cable
Cenref Labs	Questran Corporation
Chemagnetics	Rainin Instruments
Doty Scientific, Inc.	Resonance Research
Extrel, Division of Millipore	Rocky Mountain Scientific
Finnigan MAT	Glass Blowing
FISONS Instruments	Spectral Data Services
GMW Associates	Superior ICP
High-Purity Standards	Tekmar Company
Hitachi Instruments	Thermo Jarrell Ash
Huffman Labs	VarianNMR
JEOL USA	Waters Chromatography,
Kurt Lesker Company	Division of Millipore
Mattson Instruments, Inc.	Zymark Corporation

Time and space are also available for exhibitors interested in sponsoring short workshops. Contact Jim Parker, at the above location for more information.

SOCIAL PROGRAM AT THE RADISSON HOTEL

REGISTRATION NIGHT MIXER

A cash bar will be open in the conference registration area of the Radisson Hotel Denver on Sunday evening, August 2, from 7:00-9:00 p.m. Plan to meet other conference attendees and beat the Monday rush to pick-up your conference badge and abstract book.

CONFERENCE MIXER

On Monday afternoon, August 3, immediately after the conference, please join us for a cocktail and hors d'oeuvre mixer at the Radisson Hotel in the Exhibit area.

CONFERENCE BANQUET

The conference banquet will be on Tuesday, August 4, from 7:00-10:00 p.m. in the Majestic Ballroom of the Radisson. Tickets are \$30.00 each. There will be a cash bar in the Majestic Lounge at 6:00 p.m. The speaker for the banquet will be Chancellor Dwight M. Smith. Dr. Smith will speak on the subject of *"Higher Education in the 90's; Challenges To Its Credibility."*

Dr. Dwight M. Smith, former Chancellor of the University of Denver, became President of Hawaii Loa College in July 1990, bringing more than 30 years of experience in higher education as an administrator, researcher, and teacher. A member of the University of Denver faculty since 1972, Dr. Smith served as Chairman of the Department of Chemistry and Vice Chancellor of Academic Affairs, in addition to Chancellor. He earned his bachelor's degree at Central College in Iowa and his Ph.D. at Pennsylvania State University. He was a postdoctoral fellow at California Institute of Technology and a National Science Foundation Fellow at Scripps Institution of Oceanography. Dr. Smith held the position of Senior Chemist with Texaco Research Center before beginning his academic career at Wesleyan University in Connecticut. He has authored more than 50 scientific articles and has established an international reputation in the fields of surface and atmospheric chemistry.

TOURS

Everyday:	Mountain Casino Tour	\$15
	Departs 10:00 a.m. Return 4:00 p.m.	
Monday, August 3	Pikes Peak & Air Force Academy	\$30
	Depart 8:00 a.m. Return 6:00 p.m.	
Tuesday, August 4	Rocky Mountain National Park	\$28
	Depart 8:00 a.m. Return 6:00 p.m.	
Wednesday, August 5	Squaw Pass & Georgetown Loop Railroad	\$24
	Depart 8:00 a.m. Return 4:00 p.m.	
Wednesday, August 5	Country Dinner Playhouse	\$35
	Depart 5:00 p.m. Return 11:00 p.m.	

Lunch is not included in the price of the tours. All tour groups will leave from the Radisson Hotel. For further information and reservations, please contact Hanna Golderg, 5741 E. Fair Place, Englewood, CO 80111 (303) 779-8147. Please make your reservations early. Tours will only run if full.

Name: _____

Address: _____

City, State, Zip _____

Phone: _____

Tour(s): _____

Amount enclosed: \$ _____

Send this form and check for entire amount for tours to Hanna Golderg at above address.

TRAVEL

Special Rocky Mountain Conference Fares on Continental Airlines

Continental Airlines has joined with the Rocky Mountain Conference to offer special airfares that are not available to the general public when you attend the Conference and travel between July 23, 1992 and August 8, 1992, inclusive.

Continental Airlines will offer a variety of discount fares: call for availability. To obtain these special fares, follow these easy steps:

1. Phone Continental at (800) 468-7022. Call weekdays from 6:00 a.m. to 12:00 midnight, CST, and on Saturdays from 8:00 to 4:00 p.m. CST.
2. The identification number assigned to the Rocky Mountain Conference is EZ8T53.
3. Continental specialists will provide information and make reservations for all flights and fares, including the special conference fare. This fare is available on Continental flights within the United States (in Canada, ask for the special meeting fare).

Whichever means of ticketing you choose, the special conference fare can only be obtained when the reservation is initiated by phone through the special Continental 800 number listed above.

Seats are limited, so call early for best availability. Fares are guaranteed at time of ticket purchase. Tickets must be requested two weeks in advance of desired travel. Tickets may not be sold or bartered.

HOTEL ACCOMMODATIONS

Hotel rooms where the conference is being held, at the Radisson Hotel Denver, 1550 Court Place, Denver, CO 80202, (303) 893-3333, are available at the special discounted conference rate of \$80 per night (singled \$90 per night (double)), plus applicable tax. Please use the discount coupon in the center of this booklet to insure that you receive the special rate. Suites available upon request at the conference discount. The reservation form in the center of the booklet must be returned directly to the hotel. Conference location and all associated social functions for the conference will be held at the Radisson Hotel Denver.

Additional hotels, within easy walking distance or a short ride on the 15th Street Mall shuttle bus (free), are listed below. Locations are given on the map inside the back cover. For rates and reservations, contact the hotel directly.

The Brown Palace Hotel, 321 17th Street, Denver, CO 80202. (303) 297-3111 or (800) 321-2599: (800) 228-2917 in Colorado.

Comfort Inn, 401 17th Street, Denver, CO 80202. (303) 296-0400, (800) 237-8431 (outside Colo), (800) 631-2090 (in Colo).

Executive Tower Inn, 1405 Curtis Street, Denver, CO 80202. (303) 571-0300 or (800) 525-6651.

Hyatt Hotel, 1750 Welton Street, Denver, CO 80202, (303) 295-1200 or (800) 527-4727.

Hotel Denver-Downtown, 1450 Glenarm Place, Denver, CO 80202, (303) 573-1450 or (800) 423-2201 (in Colo), (800) 423-5128 (outside Colo).

Marriott City Center, 1701 California Street, Denver, CO 80202, (303) 297-1300 or (800) 228-9290.

Warwick Hotel, 1776 Grant Street, Denver, CO 80203, (303) 861-2000 or (800) 525-2888.

VISITOR INFORMATION

Denver and the surrounding area boast a large number of activities that are enjoyable for both young and old. For additional information contact the Denver Metro Convention and Visitors Bureau, 225 W. Colfax Avenue, Denver, CO 80202, (303) 892-1112. For information about statewide attractions contact the Colorado Tourism Board, 1625 Broadway, Suite 1700, Denver, CO 80202, (303) 592-5510.

MESSAGE CENTER

Incoming telephone messages for conferees will be posted at the message center in the registration area. The telephone is (303) 893-3333, ext. 337. Ask for the Rocky Mountain Conference on Analytical Chemistry message center. This service will be available from 8:00 a.m. to 3:30 p.m. Monday-Wednesday and from 8:00 a.m. to 10:00 a.m. Thursday.

RESTAURANT SERVICE

The Communications Department of the Denver Metro Convention and Visitors Bureau will provide a FREE restaurant service designed to let out-of-town delegates know about Denver's world class dining opportunities, from casual to elegant. The Dining Desk will have a header that reads "Free Restaurant Reservations", and will also have an experienced reservation person, a phone and a cart featuring poster-size menus that delegates can browse through. This service has been in operation for five years and has been extremely successful in providing delegates with convenient, courteous, and efficient service.

MEMBERSHIP COMMITTEE

The Colorado Section of The American Chemical Society, Membership Committee will have a booth for prospective members. On-site membership sign-up will be available. Prior to the Conference, inquires can be sent to:

Marvin C. Goldberg, Chairman
PO Box 25046
Mail Stop 424
Lakewood, CO 80225
(303) 236-4728

EMPLOYMENT CLEARING HOUSE

The Employment Committee of the Colorado Section of the American Chemical Society will sponsor a workshop on: *Resume Preparation and Conduct During An Interview*. The workshop will be conducted by Shawn Moul, Lab-Support, on Tuesday morning, August 4. The workshop will consist of formal presentations by Shawn, with follow-up discussion on an individual basis

The employment committee will also conduct an employment clearing house. Resumes will be accepted prior to, and during the meeting, for review by prospective employers. Facilities will be available for on-site interviews by employers. Employers who are interested in using this employment booth should register by contacting one of the employment committee members listed below by July 20, 1992.

Douglas B. Manigold, Chairman
U.S. Geological Survey
5293 Ward Road
Arvada, CO 80002
(303) 236-5345
FAX (303) 467-9598

Sonia Atwood
Marathon Oil Company
PO Box 269
Littleton, CO 80160
(303) 794-2601
FAX (303) 794-1720

Helen Brandenburg
U.S. Geological Survey
5293 Ward Road
Arvada, CO 80002
(303) 467-8224
FAX (303) 467-9598

Ronald G. Thompson
Marathon Oil Company
PO Box 269
Littleton, CO 80160
(303) 794-2601 ext. 708
FAX (303) 794-1720

Interested employers and job seekers can receive additional information on available jobs and on the employment booth activities by calling the ACS Employment committee Hotline number which is (303) 933-4375.

VENDOR WORKSHOPS

The Art of Sample Preparation for Spectrochemical Analysis

Instructor: Theodore C. Rains

Thursday, August 6, 1992 8:30 a.m. - 12:00 noon

\$25.00

This course is intended for the chemist, analyst, biochemist, or clinician who is interested in state-of-the art sample preparation for instrumental methods. Techniques used at the National Institute of Standards and Technology (formerly National Bureau of Standards) for the preparation of standard solutions will be described. Topics covered include sampling, sample dissolution procedures for metals, ores, glasses, clays, air particulates, foods, and biological tissue techniques to control the analytical blank, preparation and storage of standard stock solutions, and separation and preconcentration techniques. The course will include techniques to alleviate contamination in trace elemental analysis and to improve quality assurance in the analytical laboratory.

Theodore C. Rains is a senior research chemist (retired) from the National Institute of Standards and Technology (NIST) and presently president of High-Purity Standards. In his 13 years of experience at Oak Ridge National Laboratory and 25 years at NIST, he has acquired vast experiences in the area of sample preparation and trace elemental analyses for certification of over 400 new and renewed Standard Reference Materials, he has lectured extensively at national and international meetings and has over 160 technical publications.

To register: Send check for \$25.00 to High Purity Standards, Inc. PO Box 30188, Charleston, SC 29417. For information call: (803) 556-3411 or FAX (803) 556-8171.

Name: _____
Organization: _____
Address: _____
City, State, Zip _____
Phone: _____ Fax: _____

VENDOR WORKSHOPS

*MICROWAVE SAMPLE PREPARATION FOR AA/ICP
ANALYSIS WORKSHOP*

Date: August 6, 1992: 9:00 a.m. - 12:00 noon

Presented by: CEM Corporation
PO Box 200
Matthews, NC 28106

To register please call: Karen Abee at (800) 728-3331 CEM Corporation

The workshop is designed for users as well as prospective users of microwave sample preparation systems. Topics include:

New Advancements in Microwave Technology Temperature and Pressure

How and Why Demonstration of Software/Temperature/Pressure Capabilities

•Microwave Theory, Easily Understood*

EPA Regulations....Where are we?

Detail Application Discussions for the Preparation of: Oils, Soils, Filters, Paint Chips, Tissues, and Mixed Wastes

FINNIGAN MAT USERS MEETING

Date: August 6, 1992

Presented by: Finnigan

To register and submit topics for discussion, call Lelah Wright at (415) 433-4800, ext. 2384.

The local Finnigan MAT User's Meeting is scheduled during the Rocky Mountain Conference for Applied Spectroscopy in Denver, CO. The purpose of this meeting is to bring together our users to help stimulate productive exchange of ideas, and to update you on the direction of the company and our products. Finnigan MAT representatives will be present to answer your questions regarding products, applications and customer service. This meeting is meant to benefit those directly involved with the use of our mass spectrometers. An announcement with the presentation schedule and registration form will follow.

*AN OVERVIEW OF RECENT ADVANCES IN FTIR
SPECTROSCOPY*

Presented by: Bio-Rad
To register: contact Bob Dyse (303)794-0509

Topics include:

- Spectral Mapping via Reflectance Microprobe
- *Dept Profiling via FTTR/Step-Scan Photoacoustic Techniques
- *StepScan and Time Resolved Methods
- *2D & 3D FTTR Techniques
- Applications for FT-Raman
- *New Hyphenated FTTR Techniques

*INCREASING PRODUCTIVITY WITH
CHROMATOGRAPHY AUTOMATION*

Presented by: Dionex Corporation
Date: Wednesday, August 5, 1992; 8:30-11:30 a.m.
To register: contact Lee Ramirez, Dionex Corporation (303) 771-2129

Gain an understanding of your automation and data processing needs for GC, LC, IC, CE, and SFC. This seminar will help you access and prioritize those needs so that you can choose the right system for your laboratory. Get an overview of the new Microsoft Windows 3.1 and the new Dionex AI-450 3.3. Learn how AI-450 and Windows lets you take advantage of memory beyond the 640K DOS barrier to multi-task applications without compromising performance. Learn how the built-in clipboard and Dynamic Data Exchange (DDE) features of AI-450 and Windows let you quickly and accurately transfer both text and graphics between applications. Discover how easy it is to create professional-quality custom reports. Learn how easily your chromatography workstations can be linked together with a LAN or LIMS to centralize data storage and why distributed data processing with PC front-end workstations has significant advantages over centralized systems. See for yourself how easy it is to tap into the power of the Windows 3.1 environment and the AI-450 software.

ADVANCES IN CHROMATOGRAPHY SEPARATIONS BY
CAPILLARY ELECTROPHORESIS, UIB
CHROMATOGRAPHY, LIQUID CHROMATOGRAPHY,
AND SUPERCRITICAL FLUID EXTRACTION AND
CHROMATOGRAPHY.

Presented by: Dionex Corporation
Date: Wednesday, August 5, 1992; 1:00-4:30 p.m.
To register: contact Lee Ramirez, Dionex Corporation (303) 771-2129

This seminar will explore different solutions for expanding your laboratory capabilities from sample preparation to the final analysis. Chromatography separations by CE, IC, HPLC, and SFC will be discussed in depth. Special emphasis will be placed on new advances in ion analysis by Capillary Electrophoresis. Methods development in ion analysis will be a major topic of discussion. Learn how Supercritical Fluid Extraction can increase productivity of sample prep and reduce your laboratory's solvent consumption.

EVERYTHING YOU ALWAYS WANTED TO KNOW ABOUT
LIMS BUT WERE AFRAID TO ASK

Presented by: Laboratory MicroSystems, Inc

To register contact: Dori Vallone (518) 274-1990 ext. 114
Laboratory Micro Systems, Inc.
The Hendrick Hudson Building
Troy, New York 12180

LIMS Seminar I
August 6, 1992: 9:00 a.m. to 12:00 p.m.

This seminar was designed for laboratory managers and personnel interested in Laboratory Information Management Systems (LIMS). There will be a discussion on LIMS in general including such topics as: benefits and considerations of LIMS, the evaluation process, hardware considerations, and stages of implementation. Afterwards, there will be a demonstration of the Lab Vantage LIMS, including ease of use and depth of functionality issues as well as examples of sample login, manual data entry and report generation in different types of laboratories.

MATERIALS TESTING SOFTWARE SEMINAR

LIMS Seminar II

August 6, 1992 1:00 p.m. to 3:15 p.m.

Presented by: Instron Corporation

For registration information, contact Dori Vallone at (518) 274-1990 ext. 114.

Series IX is a world popular (over 4,000 users) materials testing software designed exclusively for the Instron line of test machines. The system offers machine control and data acquisition on Instron machines including tensile, flexural (bend), compression, and yarn/fiber tests. Benefits include the ability to run tests and generate complete reports in minutes, real time autoscaling test plots eliminating chart paper, and fast setup of almost any test without programming, and complete relational database capable of searching and sorting test results for SPC/SQC (statistical processor quality control) analysis plots and special reports (e.g. certification reports). The session provides an introduction to the concept of computerized testing, benefits justification, and includes a live demonstration of Instron's Series IX software. There is no additional charge for either seminar, but registration is limited.

AIR/SOILS ENVIRONMENTAL SEMINAR

Presented by: Tekmar Company

Session I - 8:30 a.m. - 12:00 noon August 6, 1992

For more information, please contact Leslie Federle at (800) 543-4461.

This session will focus on air analysis including both thermal desorption and canister sampling.

Session II - 1:30 p.m. - 5:00 p.m.

August 6, 1992

This session will focus on the analysis of Volatile Organic Compounds in soils utilizing both Purge & Trap and Headspace Methods. The seminars are free, however registration is required.

ENVIRONMENTAL SEMINAR

Presented by: Waters, Division of Millipore

This seminar is free, however, registration is recommended. If additional information is required, please contact Denise Kent at (800) 632-2708 ext. 2168. If you would like to register, simply leave your name and number and Denise will call you back.

As more environmental analysis methods are turning to HPLC and HPLC-Mass Spec, the Waters Chromatography Division of Millipore is sponsoring an Environmental workshop for chemists involved in R& D, consulting, and the Contract Laboratory Program. The seminar will consist of interactive lectures regarding new and accepted methods of analysis by HPLC and HPLC-MS, and sample prep for GC and HPLC. Topics to be discussed are:

- *Sample preparation by solid phase extraction, with particular emphasis on aldehydes and ketones in air.
- Sample extraction of organics in water (Methods 525 and 550.1) with trifunctional C18 SPE cartridges.
- *GPC Sample Cleanup
- Organic Analysis - New HPLC Methods for Environmental Analysis
- Inorganic Analysis - Ion Chromatography~Yes you can do it now on existing gear!!

ENVIRONMENTAL SAMPLE PREPARATION

Presented by: Zymark Corporation, August 6, 1992

For registration information contact Zymark Corporation at (303) 838-5825 or write to Zymark Corporation, Zymark Center, Hopkinton, Massachusetts 91748 (508) 435-9500 .Fax (508) 435-3439

This workshop will cover the basic aspects of sample preparation for EPA method series 500, 600, and 8000. Evaporation and sample preparation on the Tubovap and Benchmate work stations will be demonstrated. A new product release for large volume solid phase extraction will also be demonstrated for use in herbicide and pesticide extraction from water. Zymark Corporation will host a one half day hands on workshop for environmental sample Preparation. This workshop is free to the registrants of The Rocky Mountain Conference. Those not attending the conference may attend for a fee of \$100.00.

•
ThermoSPEC SOFTWARE SEMINAR

Presented by: ThermoSPEC , August 6, 1992 8:30-5:00

Fee: \$35.00

A workshop for experienced users of ThermoSPEC software for Thermo Jarrell Ash AAS and ICPES systems will be offered to Conference attendees at an additional \$35.00 charge for the workshop that includes lunch. A structured learning session, led by Ron Manabe will be held in the morning with open discussion following the lunch break. Space is limited for this workshop and pre-registration is recommended. The deadline for on-site registration is noon, Monday, August 3. Call (415) 327-5605 if additional information is needed. Seminar topics include:
•Latest Features of ThermoSPEC Version 5.0x* *Real Life Experiences with LIMs and LANs* *Multi-tasking Revisited* *Command Language Update* *Hints and Tricks for Sequential ICAP Systems* *What's New with ThermoLINC* *Multielement Flame, ASAMP, AP Programming*
•General Method Development for Graphite Furnace, Matrix Modifiers, and Multielement Furnace Analysis* In addition to the above topics, users are encouraged to give presentations in the afternoon on their experiences with ThermoSPEC software or unique applications of ICAP or Atomic Absorption instruments in their own labs. Please send a brief title to Dr. Ronald Manabe, Thermo Jarrell Ash, 175 Jefferson Drive, Menlo Park, CA 94025. The registration fee for this seminar may be added to your RMC pre-registration payment.

ThermoSPEC, August 6, 1992 8:30-5:00 Fee: \$35.00

Name: _____

Organization: _____

Address: _____

City, State, Zip _____

Phone: _____ Fax: _____

Refund Policy: Full refunds will be made if requests are received on or before July, 15, 1992.

BRUKER INSTRUMENT CORPORATION: Friday, August 6, 1992. For information on this vendor workshop call: Art Heiss (508) 663-7885.

SHORT COURSES

(Sponsored by the Colorado Section of the ACS)

The Education Committee of the Colorado Section of the ACS is offering short courses in conjunction with the 34th Rocky Mountain Conference on Analytical Chemistry as described below. Registration forms are included following this page. The Radisson Hotel Denver has agreed to provide lodging for short course participants at the special conference rate. Please mention the 34th Rocky Mountain Conference on Analytical Chemistry when making reservations. All courses will be taught at the University of Colorado at Denver, in downtown Denver. Tuition will be refunded if course registration is canceled before July 10, 1992.

QUALITY ASSURANCE PRACTICES FOR THE ENVIRONMENTAL LABORATORY

Steve Callio

2 days: August 6-7, 1992

Tuition: member \$350; non-member \$400

BASIC ELECTRONICS FOR SCIENTISTS

Dr. James B. Calvert

2 days: August 6-7, 1992

Tuition: member \$350; non-member \$400

BASIC PRINCIPLES OF MASS SPECTROMETRY AND INTERPRETATION OF ORGANIC MASS SPECTRA

Dr. J.A. Zirrolli

3 days: August 5-7, 1992

Tuition: member \$400; non-member \$450

Registration deadline for all courses is July 10, 1992. For more information contact:

Dr. Joseph A. Zirrolli
National Jewish Center
Dept. of Pediatrics, K923
1400 Jackson Street
Denver, CO 80206
TEL 303-398-1136
FAX 303-398-1694

Marilyn Johnsen
University of Denver
Dept. of Chemistry
Denver, CO 80208
OR
TEL 303-871-2580
FAX 303-871-2587

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SHORT COURSE REGISTRATION
 Courses Sponsored by Colorado Section American Chemical Society
 at the 34th Rocky Mountain Conference
 Denver, Colorado

	Member (ACS,SAS,RMCDG)	Non-Member
Quality Assurance Practices for the Environmental Laboratory		
August 6-7, 1992	\$350	\$400
Basic Electronics for Scientists		
August 6-7, 1992	\$350	\$400
Basic Principles of Mass Spectrometry and Interpretation of Organic Mass Spectra		
August 5-7, 1992	\$400	\$450

Name: _____

Organization: _____

Address: _____

City,State,Zip: _____

Phone: _____ FAX: _____

Make checks payable to "Colorado Section ACS" and send payment with this form to:

Dr. Joseph A. Zirrolli
 Dept. of Pediatrics K923
 National Jewish Center
 1400 Jackson Street
 Denver, CO 80206
 Phone: (303) 398-1136
 FAX: (303) 398-1694

*QUALITY ASSURANCE PRACTICES FOR THE
ENVIRONMENTAL LABORATORY*

Instructor: Steve Callio
August 6-7, 1992
Tuition: \$350 member; \$400 non-member

This two day short course is designed for laboratory analysts who require an introduction to quality assurance practices used in environmental measurements. The course starts with a discussion of basic statistical concepts required in QA, i.e., detection limits, confidence limits, determination of standard deviations; then the principles of quality assurance are explained and discussed in depth. These range from the preparation of duplicate and spiked samples, use of internal standards and standard reference materials, and instrument calibration to the role of the QA manager, training requirements and record documentation. Examples of the application of these procedures (nitrate, phosphate), ICP of metals, GC analyses; residual chlorine and fluoride determinations are then discussed. In addition to laboratory analysts, engineers and project officers who use laboratory-generated data in their programs and require a better understanding of how the data are obtained, will benefit from this course.

Faculty: Steve Callio, B.S., M.S., has more than 15 years of experience in Environmental Analytical Chemistry. He has worked with government and private testing laboratories and in the Laboratory Quality Assurance field. He has presented papers to EPA's Contract Laboratory Program, the Symposium on Solid Waste Testing and published with ASTM and Atomic Spectroscopy.

For short course registration by July 19, 1992, use the form preceding the course description.

BASIC ELECTRONICS FOR SCIENTISTS

Instructor: Dr. James B. Calvert

August 6-7, 1992

Tuition: \$350 member; \$400 non-member

This two day intensive course will take the student from the basic physics of electronics and electrical circuits to the design and trouble shooting of transistor and op-amp circuits. No previous knowledge of electronics is assumed. This course will be both quantitative and experimental. You will work with a kit of components, making circuits and testing them with electronic instruments. You will become familiar with common electronic components and learn how to assemble them. The course will familiarize you with fundamental concepts useful in electronics such as impedance, single-time constants, feedback and working models for semiconductor devices. These concepts will allow you to understand and use electronics with increased confidence. The student should bring a digital multimeter or equivalent to the course, so that they will become familiar with the use of their own instrument. Some multimeters will be available for students who do not bring their own.

Faculty: Dr. James B. Calvert, P.E., is Associate Professor of Physics and Engineering at the University of Denver. He prepared and presented courses in electronics and microcomputers there since 1979 and has over 20 years of university teaching experience. Dr. Calvert's research and interests have been in ultrasonics, optics, atomic and molecular structure, quantum mechanics, analog integrated circuits and history of technology. He is a registered professional engineer in the state of Colorado.

For short course registration by July 19, 1992, use the form preceeding the course description.

*BASIC PRINCIPLES OF MASS SPECTROMETRY AND
INTERPRETATION OF ORGANIC MASS SPECTRA*

Instructor: J.A. Zirrolli, Ph.D.

August 5-7, 1992

Tuition: \$400 member; \$450 non-member

This three day course will describe the principles of modern mass spectrometry and apply them to the identification of organic compounds. Sample introduction methods (GC, LC, vapor, direct probe), ionization processes (positive, negative, FAB, chemical, electronic), mass analysis and detection will be discussed with emphasis on molecular ion analysis and simple fragmentation processes. The course will develop an approach to the determination of elemental composition and diagnostic fragmentation patterns, and the student will become familiar with the mass spectra characteristic of common organic compound classes, drugs, pesticides and pollutants. The course is based upon and uses as a reference the text, *Interpretation of Organic Mass Spectra*, Third Edition by F.W. McLafferty, University Science Books, 1980, which will be provided.

Faculty: Dr. Joseph A. Zirrolli is a Research Associate in the Department of Pediatrics and Research Director of the Mass Spectrometry Center at the National Jewish Center for Immunology and Respiratory Medicine at Denver. He is a member of the American Chemical Society and the American Society of Mass Spectrometry.

For short course registration by July 19, 1992, use the form preceding the course description.

Organizers of the 34th Rocky Mountain Conference

Conference Chairman - Marvin C. Goldberg, U.S. Geological Survey, Denver Federal Center, PO Box 25046, MS 424, Lakewood, CO 80225, (303) 236-4728

Program Chairman Pro Tern - Carlos Arozarena, US Geological Survey 5293Ward Road Arvada, CO 80002, (303)467-8035

Exhibits - Jim Parker, Manville Tech Center, Mail Stop R-38 PO Box 5108, Denver, CO 80217, (303) 978-5481

Registration - Joe Broadus US Geological Survey, 6293 B Ward Road, Arvada, CO 80002, (303) 236-5345
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Cathy Honda, Gates Rubber Company, PO Box 5887, Denver, CO 80217
Vanessa Fishback, 7578 Aberdeen Way, Boulder CO 80301

Audio Visual - Mark Brugh, E G & G - Rocky Flats, PO Box 464, Building 881, Golden, CO 80402

Mailing List - Carol Gies, E G & G - Rocky Flats, PO Box 464, Building 881, Golden, CO 80402

Tours - Hanna Goldberg, 5741 East Fair Place, Englewood, CO 80111, (303)779-8147

Symposia Chairwomen **and** Chairman

Atmospheric Spectroscopy - Gary Rayson, Department of
Chemistry, New Mexico State University, Las Cruces, NM
88003, (503) 646-5839

Chromatography - Denise Kent, Millipore Corporation, Waters
Chromatography Division, 1161 Baca Road, Conifer, CO, (800)
532-2708 ext. 2168

Electrochemistry - Bruce Parkinson, Colorado State University,
Department of Chemistry, Ft. Collins, Co 80523, (303)491-
0504

Electron Paramagnetic Resonance - Sandra Eaton, University of
Denver, Chemistry Department, Denver, CO 80208, (303) 871-
3102

Gareth Eaton , University of Denver, Chemistry Department,
Denver, CO 80208, (303) 871-2980

Environmental Chemistry - Lynda Faires, USGS, 5293 Ward Road,
Arvada, CO 80002, (303) 467-8078

FTIR/NIR/RAMAN Spectroscopy - Abdul Chughtai, University of
Denver, Chemistry Department, Denver, CO 80208, (303)871-
4404

General Posters - Mary Cast, U.S. Geological Survey, 5293 Ward Rd.
Arvada, CO 80002 (303) 467-8044

Hazardous Waste - Laura Peitersen, University of Wyoming,
Department of Chemistry, Box 3838 University Station, Laramie,
WY 82071-3838 (307) 733-4363

ICP/Mass Spectroscopy - Howard Taylor, U.S. Geological Survey,
U.S. 4, 325 Broadway, Boulder, CO 80303 (303) 541-3007

Laboratory Total Quality Management - Erie A. Lewis, LEADS Corporation, 1240 Clear Creek Road, Evergreen CO 80439 (303) 567-2681

Luminescence - DeLyle Eastwood - Lockheed Engineering, 1050 East Flamingo Road, Suite 242, Las Vegas, NV 89119, (702)734-3287

Robert Hurtubise - University of Wyoming, Department of Chemistry, Box 3838 University Station, Laramie, WY 82071 (307) 766-6241

Mass Spectrometry - Joseph Zirrolli, Department of Pediatrics, K923, National Jewish Center, Denver, CO 80206, (303)398-1853

Steve Zaugg, USGS, 5293 Ward Road, Arvada, CO 80002, (303) 467-8207

Nuclear Magnetic Resonance - Hellmutt Eckert, University of California, Santa Barbara, Department of Chemistry, Santa Barbara, CA 93106 (805) 893-8163

Pharmaceutical Analysis - Patricia Sulik, Rocky Mountain Instrumental Labs, 456 S. Link Lane, Ft. Collins, CO 80524 (303)530-1169

Robert Lantz, Rocky Mountain Instrumental Labs, 456 S. Link Lane, Ft. Collins, CO 80524 (303) 530-1169

Quality Assurance - William Shampine, USGS, PO Box 25046, MS 401, Denver Federal Center, Denver, CO 80225 (303)236-1940

Victor Janzer, 1873 S. Robb Street, Denver, CO 80232 (303) 980-5626

Robotics - Richard Pfeiffer, US Department of Agriculture, National Soil Tilth Laboratory, 2150 Pammel Drive, Ames, IA 50011 (515) 294-0136

SYMPOSIUM ON ATOMIC SPECTROSCOPY
Organized by Gary D. Rayson

Tuesday, August 4, 1992

KEYNOTE SPEAKER

- 8:30 RECENT ADVANCES IN ANALYTICAL CHEMICAL MEASUREMENTS IN MICROWAVE PLASMAS. Charles B. Boss, Department of Chemistry, North Carolina State University, Raleigh, NC.
- 9:10 OPEN FOCUSED MICROWAVE DIGESTION SYSTEM FOR PREPARATION OF BIOLOGICAL SAMPLES FOR INDUCTIVELY COUPLED PLASMA SPECTROMETRY. A. Krushevska, L. Martines, C. Amarasiriwaradena and R.M. Barnes, Department of Chemistry, Lederle Graduate Research Center, University of Massachusetts, Amherst, MA 01003-0035.
- 9:30 THE DETERMINATION OF LEAD IN WINE, FORTIFIED WINE AND GRAPE JUICE BY GRAPHITE FURNACE ATOMIC ABSORPTION SPECTROMETRY. J.E. Schelzel, Thermo Jarrell Ash, 175 Jefferson Drive, Menlo Park, CA 94025.
- 9:50 BREAK
- 10:20 THE USE OF FLOW INJECTION PRECONCENTRATION TECHNIQUES FOR THE DETERMINATION OF LEAD IN WATER. S. McIntosh and R. Hergenreder, Perkin-Elmer Corporation 761 Main Ave., M/S 219, Norwalk CT 06859 and 14818 W. 6th Ave., Suite 6, Golden, CO 80401.
- 10:40 A REVIEW OF THE DETECTION CAPABILITIES OF ICP-AES FOR THE DETERMINATION OF AL IN BIOLOGICAL AND ENVIRONMENTAL MATERIALS. LB. Brenner, Geological Survey of Israel, 30 Malkhe Israel St., Jerusalem, 95501 Israel.

11:00 DETERMINATION OF THE ELEMENTAL COMPONENTS OF LITHIUM ALUMINATE CERAMICS BY INDUCTIVELY COUPLED PLASMA ATOMIC EMISSION SPECTROSCOPY. N. J. Hotz and W. F. Bauer, Idaho National Engineering Laboratory, EG&G Inc., PO Box 1625, Idaho Falls, ID 83415.

11:20 AN EVALUATION OF THE INDUCTIVELY COUPLED PLASMA AS A SOURCE FOR ATOMIC ABSORPTION MEASUREMENTS. G. D. Rayson. Chemistry Department, New Mexico State University, Las Cruces, NM 88803-0001

12:00 LUNCH

Tuesday, August 4, 1992

INVITED SPEAKER

1:40 THE SEARCH FOR SELECTIVE EXCITATION MECHANISMS IN THE INDUCTIVELY COUPLED PLASMA. P. B. Farnsworth, C. M. Ogilvie, and M. C. Asplund, Chemistry Department, Brigham Young University, Provo, UT 84602.

2:20 Sc AND Mg ION/ATOM RATIOS AS DIAGNOSTIC TOOLS FOR THE DISCRIMINATION OF EIE AND PHYSICAL TRANSPORT EFFECTS DUE TO HIGH CONCENTRATIONS OF Ca, Mg AND Na USING ULTRASONIC NEBULIZATION. I. B. Brenner and S. Erlich, Geological Survey of Israel, 30 Malkhe Israel St., Jerusalem, 95501, Israel.

2:40 AN EXCITATION TEMPERATURE MEASUREMENT IN THE ICP INDEPENDENT OF LTE ASSUMPTIONS. G.D. Rayson and M. Durate, Chemistry Department, New Mexico State University, Las Cruces, NM 88003.

3:00 BREAK

3:30 APPLICATION OF A SOLID STATE DETECTOR FOR THE OBSERVATION OF ATOMIC EMISSION FROM AN ICP. R. M. Manabe, R. Foster, and M. Pilon, Thermo Jarrell Ash Corporation, 175 Jefferson Drive, Menlo Park, CA 94025.

- 3:50 DETERMINATION OF Li AND TRACE ELEMENTS IN LITHIUM ALUMINATES USING ELECTROTHERMAL FURNACE ATOMIZATION WITH AA/ICP DETECTION. E. B. McNew, W. F. Bauer, and D. D. Siemer, Idaho National Engineering Laboratory, EG&G Inc., PO Box 1625 Idaho Falls, ID 83415.
- 4:10 ANALYSIS OF ULTRATRACE CONTAMINANTS IN A HIGH TUNGSTEN MATRIX. Sarah McGinty, Serapio Ayala, Steve Govorchin, and Steven Hughes, Bandgap Technology, 325 Interlocken Parkway, Broomfield, CO 80021.

SYMPOSIUM ON CHROMATOGRAPHY

Organized by Denise Kent

Tuesday, August 4, 1992

- 8:25 INTRODUCTORY REMARKS, Denise Kent
- 8:30 A TWO-CHANNEL SULFUR AND NITROGEN PHOSPHORUS DETECTOR FOR GC. Thomas Rverson, Robert Barkley, and R.E. Sievers, University of Colorado, Boulder, CO.
- 9:00 THERMAL DESORPTION-GC-MS DETERMINATION OF THE CHEMICAL COMPOSITION OF SOLID PRODUCTS OF JET FUEL OXIDATION. William D. Schulz, Eastern Kentucky University, Richmond, KY.
- 9:30 USE OF HPLC FOR SCREENING OLIVE OIL GRADES: COMPARISON OF TRIGLYCERIDE AND DIGLYCERIDE PROFILES TO DETERMINE REFINED VS. VIRGIN GRADES. Richard V. Flor, U.S. Custom Service, Washington, DC.
- 10:00 PHOTOSELECTIVE SEPARATION OF OLEFINS FROM SATURATED HYDROCARBONS. David J. Semin and Kathy Rowlen, University of Colorado, Boulder, CO.
- 10:30 BREAK

- 11:00 IMPROVED HPLC/POST-COLUMN TECHNIQUES FOR RUGGED CARBAMATE ANALYSIS. Michael Dong and Craig Sellman, Perkin-Elmer Corporation, Norwalk, CT.

Symposium of Electrochemistry
Organized by Bruce A. Parkinson

Monday, August 3, 1992
Bruce Parkinson, Presiding

- 9:00 PHOTOELECTROCHEMISTRY OF LUMINESCENT POROUS SILICON. Michael J. Sailor. Grace M. Credo, Conine L. Curtis, Vincent V. Doan, Julie L. Heinrich and Jeffrey M. Lauerhaas, University of California San Diego, San Diego, CA.
- 9:30 PHOTOELECTROCHEMISTRY AND RAMAN SPECTROSCOPY OF COPPER THIOCYANATE FILMS. N.R. de Tacconi. Y.Son and Krishnan Rajeshwar, University of Texas at Arlington, Arlington, TX.
- 9:50 THE PHOTODEPOSITION OF COPPER ON TITANIUM DIOXIDE AQUEOUS SUSPENSIONS. Nancy S. Foster and Carl Koval, University of Colorado, Boulder, CO.
- 10:10 BREAK
- 10:20 FROM NANOMETER-SIZED METAL DOTS TO FRANCES MOTT. Reginald M. Penner. W. Li, M. Barsky and J. A. Virtanen. University of California, Irvine, CA.
- 10:50 PREPARATION OF MICROPOROUS ALUMINUM FILMS FOR USE AS TEMPLATES FOR THE SYNTHESIS OF NANOMETER SIZED PARTICLES. Jon A. Stockhart. G. Louis Hornyak, Colby A. Foss, Jr., and Charles R. Martin, Colorado State University, Ft. Collins, CO.

- 11:10 ELECTROCHEMISTRY OF WATER-SOLUBLE PORPHYRINS. Gordon M. Miskelly and Rosalie R. Richards. University of Southern California, Los Angeles, CA.
- 11:30 SPECTROELECTROCHEMISTRY OF A RUTHENIUM-COBALT SYSTEM CONTAINING THREE BRIDGING BISBIPYRIDYL ALKANE LIGANDS. Sue Ferrere and C. M. Elliot, Colorado State University, Ft. Collins, CO.
- 11:50 NOVEL LINKED-BIPYRIDINES AND TERPYRIDINES FOR CATALYTIC REDOX POLYMER MODIFIED ELECTRODES. Daniel L. Feldheim, Christopher J. Baldy and C. M. Elliot, Colorado State University, Ft. Collins, CO.

Monday, August 3, 1992

Afternoon Session, Reginald Penner, Presiding

- 1:30 BIMETALLIC ALLOYS AS LCEC DETECTORS FOR CARBOHYDRATES. Theodore Kuwana, Peifang F. Luo and Juan Marioli, University of Kansas, Lawrence, KA.
- 2:00 THE USE OF POLYPYRROLE AND DOPED-POLYPYRROLE FILMS FOR THE REMOVAL OF IONIC SOLUTION SPECIES. Douglas E. Wedman and Carl Koval, University of Colorado, Boulder, CO.
- 2:20 MOLECULAR EFFECTS IN TEMPLATE-SYNTHESIZED POLYPYRROLE FILMS. Vinod P. Menon and Charles R. Martin, Colorado State University, Ft. Collins, CO.
- 2:40 TEMPLATE SYNTHESIZED POLYANILINE MICROTUBULES. Raniani P. Vinod and Charles R. Martin, Colorado State University, Ft. Collins, CO.
- 3:00 BREAK
- 3:10 INFLUENCE OF SUPPORTING ELECTROLYTE ACTIVITIES ON ELECTRODE POTENTIALS MEASURED FOR MODIFIED ELECTRODE SURFACES. Jody G. Redepenning, Benjamin Miller and Sandra Burnham, University of Nebraska, Lincoln, NE.

- 3:30 NUCLEOPHILIC BONDING OF AMINES TO CARBON FIBER SURFACES TO IMPROVE THE ADHESION OF COMPOSITES. Chien-Ming Peng and Dan Buttry. University of Wyoming, Laramie, WY.
- 3:50 HIGH FREQUENCY AC VOLTAMMETRY. A.S. Baranski and K. Winkler, University of Saskatchewan, Saskatoon, Saskatchewan.
- 4:10 CHLOROALUMINATE MELTS TRULY LEWIS NEUTRAL? Thomas L. Riechel and John S. Wilkes, United States Air Force Academy, Colorado Springs, CO.
- 4:30 DECHLORINATION REDUCTANT MONITORING BY COULOMETRY. C.O. Huber and N. Ekkad. University of Wisconsin, Milwaukee, WI.

SYMPOSIUM ON ENVIRONMENTAL CHEMISTRY
Organized by Lynda M. Faires
SPONSORSHIP OF THIS SYMPOSIUM BY FINNIGAN
MAT IS GRATEFULLY ACKNOWLEDGED

Monday, August 3, 1992
Edward T. Furlong, Presiding

- 8:40 NEW INNOVATIONS IN PURGE AND TRAP: THE GUIDE TO INCREASED PRODUCTIVITY IN YOUR LABORATORY. Tammy J. Cappel and Anne S. Williams, Tekmar Company.
- 9:00 CHARACTERIZING TRIBUTARY LOADINGS OF ORGANIC SUBSTANCES TO CHESAPEAKE BAY: APPLICATION OF LARGE SAMPLE LIQUID-SOLID EXTRACTION TECHNIQUES. Gregory D. Foster, Katrice Lippa, and Tzyy-Heng Shawn, George Mason University.
- 9:20 DEGRADATION OF p,p'-DDT d-8 IN RIVERINE SAMPLES PRECONCENTRATED BY THE GOULDEN LARGE SAMPLE EXTRACTOR AND OCTADECYLSILANE CARTRIDGES. Paul M. Gates and William T. Foreman, U.S. Geological Survey.

- 9:40 MEASUREMENT OF THE DEGRADATION OF DIISOPROPYL METHYLPHOSPHONATE (DIMP) DURING REFRIGERATED STORAGE. Ruben Abril. Colorado Department of Health.
- 10:00 BREAK
- 10:30 INVITED SPEAKER IN ENVIRONMENTAL MASS SPECTROMETRY. ENVIRONMENTAL APPLICATIONS OF LIQUID CHROMATOGRAPHY-PARTICLE BEAM MASS SPECTROMETRY. Thomas D. Behvmer. U.S. Environmental Protection Agency.
- 11:20 APPLICATION OF HIGH PERFORMANCE LIQUID CHROMATOGRAPHY MASS SPECTROMETRY-MASS SPECTROMETRY FOR THE RAPID ANALYSIS OF PESTICIDES AND PESTICIDE DEGRADATION PRODUCTS IN ENVIRONMENTAL WATER SAMPLES. Edward T. Furlong. U.S. Geological Survey.
- 11:40 IN SITU APPLICATION OF SEMIPERMEABLE-MEMBRANE DEVICES FOR MONITORING BIOCONCENTRATION OF LIPOPHILIC CONTAMINANTS IN THE UPPER MISSISSIPPI RIVER. Geoffrey S. Ellis and Colleen E. Rostad, U.S. Geological Survey.
- 12:00 LUNCH
- Monday, August 3, 1992
Charles J. Patton, Presiding
- 1:00 SELECTIVE EXTRACTION OF ALUMINUM FROM CANADIAN DRINKING WATER SUPPLIES USING CHELEX-100. Jean-Charles Meranper, National Health and Welfare, Canada
- 1:20 SILVER RECOVERY OF ENVIRONMENTAL WATER SAMPLES USING TEMPERATURE CONTROLLED MICROWAVE SAMPLE PREPARATION. Elaine T. Hastv and W. Gary Engelhart, CEM Corporation.

- 1:40 THE PROBLEMS ASSOCIATED WITH VERY LOW DISCHARGE CRITERIA. A STUDY OF THE VARIABILITY OF CERTAIN METALS ANALYSES. Robert J. Bianchi. Ciba-Geigy Corp.
- 2:00 SAFE DRINKING WATER ACT UPDATE: RADON-TECHNOLOGIES, RISK REDUCTION, COSTS. Maria W. Tikkanen. Association of California Water Agencies.
- 2:20 APPLICATION OF ICP-MS TO THE ANALYSIS OF TRACE RADIO NUCLIDES IN ENVIRONMENTAL SAMPLES. Rob Henry. Fisons/VG Instruments.
- 2:40 BREAK
- 3:10 FIELD PRESERVATION OF NUTRIENT SAMPLES: A COMPARISON OF U.S. GEOLOGICAL SURVEY AND U.S. ENVIRONMENTAL PROTECTION AGENCY METHODS. C-J. Patton and E.P. Truitt, U.S. Geological Survey.
- 3:30 AUTOMATED HIGH-SPEED LOW-LEVEL TOTAL ALKALINITY. Carl M. Harris. U.S. Geological Survey.
- 3:50 WATER QUALITY OF STREAMS IN THE OWL CREEK DRAINAGE BASIN, NORTH-CENTRAL WYOMING. Kathy Muller Ogle. U.S. Geological Survey.
- 4:10 SOLUBILIZATION OF ARSENIC FROM ARSENIC MINERALS AND ARSENIC-BEARING GOLD ORES BY HYDROXIDE AND CYANIDE. Walter H. Ficklin, John B. McHugh, and Geoffrey S. Plumlee, U.S. Geological Survey.
- 4:30 ³¹P-NMR STUDY OF THE INTERACTION OF ELP⁺ WITH TRIBUTYL PHOSPHATE. Donna S. Smith, Cynthia J. Hargell, Northern Arizona University.

Tuesday, August 4, 1992

William T. Foreman, Presiding

- 8:30 MEASUREMENT OF MALONIC ACID SUBSTITUENTS IN FULVIC ACIDS BY ULTRAVIOLET SPECTROSCOPY OF THE BARBITURATE DERIVATIVE. Greg K. Brown and Jerry A. Leenheer, U.S. Geological Survey.
- 8:50 ANALYSIS OF VOLATILE ORGANIC COMPOUNDS IN AIR SAMPLES UTILIZING ADSORBENT TRAPS AND CANISTERS. Anne S. Williams. Tekmar Company.
- 9:10 VOC BY EPA METHOD 502.2. A STUDY OF ALTERNATIVE PRESERVATION. Yvonne Herman. Colorado Department of Health.
- 9:30 SOIL VAPOR SURVEY SURROGATES. Elizabeth Sexton and William Whiton, GEO, Inc.
- 9:50 A PROPOSED ANALYTICAL METHOD TO DETERMINE TOTAL PETROLEUM HYDROCARBONS IN SOIL AND GROUND WATER. Donald F. Harrington. Colorado Department of Health.
- 10:10 TECHNIQUES FOR IMPROVING SENSITIVITY IN HEADSPACE ANALYSIS. Tammy J. Cappel. Tekmar Company.
- 10:30 BREAK
- 11:00 INVITED SPEAKER IN ENVIRONMENTAL MASS SPECTROMETRY.
SOLVING ENVIRONMENTAL ANALYTICAL PROBLEMS USING ADVANCED MASS SPECTROMETRY TECHNIQUES. M. Judith Charles. University of North Carolina at Chapel Hill.
- 12:00 LUNCH

Tuesday, August 4, 1992

Larry G. Anderson, Presiding

- 1:00 OZONE AS A SINK FOR ATMOSPHERIC CARBON AEROSOLS. Sherry L. Stephens, Jack G. Calvert, and John W. Birks, University of Colorado, CIRES, NCAR.
- 1:20 EMISSIONS OF DIMETHYL SULFIDE BY MARINE PHYTOPLANKTON AND IMPLICATIONS FOR CLIMATE CHANGE. Priscilla L. Burrow and John W. Birks, University of Colorado, CIRES.
- 1:40 BROMOFORM EMISSION FROM ARCTIC ICE ALGAE: A MAJOR SOURCE OF ATMOSPHERIC ORGANIC BROMINE. Paul T. Buckley and William T. Sturges, University of Colorado, CIRES.
- 2:00 TREND ANALYSES OF AMBIENT CARBON MONOXIDE DATA FROM DENVER. Mary Jo Aloï, Larry G. Anderson, and John A. Lanning, University of Colorado at Denver.
- 2:20 AMBIENT FORMALDEHYDE AND ACETALDEHYDE CONCENTRATIONS IN DENVER. Regina A. Barrell, Larry G. Anderson, and John A. Lanning, University of Colorado at Denver.
- 2:40 COMPARISON OF THREE IMPROVED FLUORIMETRIC HPLC-METHODS FOR THE DETERMINATION OF FORMALDEHYDE IN THE ATMOSPHERE. Andreas H. J. Gromping and Karl Cammann, Universitat Munster, Federal Republic of Germany.
- 3:00 FORMALDEHYDE AS AN INDICATOR OF INDOOR AIR QUALITY. David L. Volk, Larry G. Anderson, and John A. Lanning, University of Colorado at Denver.
- 3:20 FLOW TUBE KINETICS & THE CHEMISTRY OF THE ClO DIMER. David O. De-Haan, John W. Birks, University of Colorado, CIRES.

15th International EPR Symposium
Organized by Sandra Eaton and Gareth Eaton

Monday, August 3, 1992

Session I - Harold M. Swartz, Presiding

- 8:30 OPENING REMARKS. S. S.Eaton
- 8:40 PRESENTATION OF INTERNATIONAL EPR SOCIETY AWARD by Harold M. Swartz, President, to George Feher.
- 8:50 AWARD ADDRESS. IDENTIFICATION AND CHARACTERIZATION OF THE REACTANTS IN THE PRIMARY PROCESS OF BACTERIAL PHOTOSYNTHESIS. George Feher, University of California at San Diego.
- 9:15 EPR/ENDOR TECHNIQUES FOR SMALL BIOLOGICAL SAMPLES. R. Isaacson. University of California at San Diego.
- 9:40 STOCHASTIC ENDOR. W. Brueggemann, J. R. Niklas. University of Paderborn.
- 10:10 BREAK
- 10:45 PULSED AND CW ENDOR AT 9 AND 35 GHz. C. E. Davoust, P. E. Doan, V. J. DeRose, C. Fan, R. J. Gurbiel, B. M. Hoffman, A. Houseman, Northwestern University.
- 11:30 COORDINATION OF VANADYL (V02+) ION BOUND TO S-ADENOSYLMETHIONINE SYNTHETASE AS DETERMINED BY ESEEM AND ENDOR MEASUREMENTS. R. LoBrutto. C. Zhang, G. D. Markham, Arizona State University, Northeastern University, and Institute for Cancer Research.
- 12:00 LUNCH

Monday, August 3, 1992

Session II - Electron spin echo envelope modulation

- 1:30 Plenary Lecture - NEW CONCEPTS IN PULSED EPR SPECTROSCOPY: FID-DETECTED HOLE BURNING AND SELECTIVE DETECTION. A. Schweiger, ETH-Zentrum.
- 2:15 SINGLE CRYSTAL ELECTRON SPIN ECHO ENVELOPE MODULATION STUDIES OF MODELS FOR COPPER SITES IN PROTEINS. M.J. Colaneri, J. Peisach, Albert Einstein College of Medicine.
- 2:45 BREAK
- 3:15 MULTIDIMENSIONAL AND MULTIFREQUENCY ESEEM STRATEGIES IN THE STUDY OF DISORDERED $S=1/2, I=1/2$ OR $I=1$ SPIN SYSTEMS. E. J. Reijerse, University of Nijmegen.
- 4:00 ZERO FIELD SPLITTING EFFECTS ON THE ESEEM OF Mn(II). A. R. Coffino, J. Peisach, Albert Einstein College of Medicine.
- 4:30 Business Meeting - International EPR Society

Tuesday, August 4, 1992

Session III - Materials Science

- 8:30 ELECTRON SPIN RESONANCE COMPARISON OF PARAMAGNETIC CENTERS IN SILICON DIOXIDE, NITRIDED OXIDE, AND REOXIDIZED NITRIDED OXIDE FILMS. J. T. Yount, P.M. Lenahan, G. J. Dunn, Pennsylvania State University.
- 8:55 THE MICROWAVE POWER SATURATION BEHAVIOR OF X-RAY INDUCED E' ELECTRON SPIN RESONANCE IN VITREOUS SiO₂. L. Zhang, F. L. Galeener, Colorado State University.

- 9:20 MICROWAVE ABSORPTION BY SINGLE AND POLY CRYSTALS OF $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$. S. K. Misra, M. Kahrizi, Concordia University.
- 9:45 BREAK - please take time to visit the exhibits
- 10:40 EPR AND FLN-ASSISTED OPTICAL ZEEMAN SPECTROSCOPY OF TETRA-OXO CHROMIUM(V) NEAR INFRARED LASER MATERIALS. T. S. Rose, R. A. Fields, M. H. Whitmore, D. J. Sineel, Aerospace Corporation and Harvard University.
- 11:10 MODELLING OF DEFECT PROPERTIES OF SILVER AND ITS IONS IN ALKALI FLUORIDES. R. Pandey, S. Veliah, C. Yu, S. A. Marshall, Michigan Technological University.
- 11:35 ELECTRON PARAMAGNETIC RESONANCE OF METAL ATOMS IN FULLERENES. M. Hoinkis, C. Yannoni, M. deVries, R. Johnson, D. Bethune, J. Salem, M. S. Crowder, IBM Research.

Tuesday, August 4, 1992

Session IV

- 1:30 NUCLEAR TRANSITION- AND HYPERFINE FREQUENCIES MEASURED WITH FID-DETECTED HOLE-BURNING EPR. T. Wacker, A. Schweiger, Swiss Federal Institute of Technology.
- 1:50 ENDOR OF NON-HEME Fe CENTERS IN PROTEINS. C. E. Davoust, P. E. Doan, V. J. DeRose, C. Fan, R. J. Gurbiel, B. M. Hoffman, A. Houseman, Northwestern University.
- 2:10 USING SATURATION-RECOVERY EPR TO MEASURE DISTANCES AND EXCHANGE COUPLINGS IN PROTEINS. D. J. Hirsh, W. F. Beck, J. B. Innes, J. B. Lynch, L. Que, Jr., G. W. Brudvig, Yale University.
- 2:30 BREAK

Session V - posters, S. S. Eaton, Presiding

3:00 - 4:00 AUTHORS PRESENT FOR POSTERS LABELED A

4:00 - 5:00 AUTHORS PRESENT FOR POSTERS LABELED B

- A CHARACTERIZATION OF THE LOCAL PROTEIN ENVIRONMENT NEAR Y_{69+} IN PSII BY ENDOR. M. Espe, N. Bowlby, I. Sithole, G. T. Babcock, L. McIntosh, U.S.Department Of Energy and Michigan State University.
- B SIMULATION AND INTERPRETATION OF MULTIFREQUENCY EPR SPECTRA FROM THE Mn(III)Mn(IV) STATE OF THE CATALASE FROM L. PLANT ARUM. A. Haddy, G. S. Waldo, R. H. Sands, J. E. Penner-Hahn, University of Michigan.
- A THE DIFFUSION OF DIOXYGEN THROUGH SPIN-LABELED STRATUM CORNEUM. M. E. Hatcher, W. Z. Plachy, San Francisco State University.
- B SPECTRAL ANALYSIS OF THE PROTEIN-DERIVED TYROSYL RADICALS FROM PROSTAGLANDIN H SYNTHASE. J. A. DeGray, G. Lassmann, R. Odenwaller, J. F. Curtis, L. J. Marnett, T. E. Eling, R. P. Mason, NTEHS and Vanderbilt University.
- A TEMPERATURE BEHAVIOR OF THE EPR SIGNAL OF NITROSYL HEMOGLOBIN. G. Bemski, E. Wajnberg, L. El-Jaick, O. R. Nascimento, A. Trautwein, W. Bill, H. Winkler, C. Butzlaff, Centra Brasileiro de Pesquisas, Universidad de Sao Paulo, and Medizinische Universitat zu Lubeck.
- B SARCOPLASMIC RETICULUM IS PROTECTED FROM OXIDATION BY THE FORMATION OF MIXED DISULFIDES. C. Coan, J.-Y. Ji, K. Hideg, R. Mehlhorn, University of the Pacific, University of Pecs, and Lawrence Berkeley Laboratory.

- A EPR INVESTIGATION OF PHOTOSYNTHETIC BACTERIAL REACTION CENTER AT X- TO W-BAND. W. Wang, Y. Zhang, A. L. Morris, P. Gast, M. C. Thurnauer, R. L. Belford, J. R. Norris, University of Illinois and Argonne National Laboratory.
- B SIMULTANEOUS MULTI-SITE EPR SPECTROSCOPY AT L BAND. A. Smirnov, S. W. Norby, H. M. Swartz, R. B. Clarkson, University of Illinois.
- A MEASUREMENT OF MOLECULAR OXYGEN CONCENTRATIONS IN THE EXTRACELLULAR BODY WATER OF TUMORS OF LIVE MICE WITH IN VIVO SPIN LABEL EPR OXYMETRY. H. J. Halpern, C. Yu, M. Peric, E. Barth, University of Chicago.
- B SPECTRAL FITTING AND NOISE REDUCTION IN THE EVALUATION OF EPR SPECTRAL PARAMETERS. C. Yu, H. J. Halpern, M. Peric, B. Bales, University of Chicago and California State University - Northridge.
- A AN ELECTRON SPIN RESONANCE SPIN TRAPPING STUDY OF FREE RADICAL INVOLVEMENT IN GRAFT FAILURE FOLLOWING ORTHOTOPIC LIVER TRANSPLANTATION IN THE RAT. H. D. Connor, W. Gao, R. G. Thurman, R. P. Mason, Kentucky Wesleyan College, University of North Carolina, and NTEHS.
- B IN SITU RADIOLYSIS ESR STUDIES OF HYDROXYALKYL RADICAL SPIN TRAPPING USING 2-METHYL-2-NITROSOPROPANE. K. P. Madden, H. Taniguchi, University of Notre Dame.
- A TRAPPING OF SINGLET OXYGEN GENERATED BY PHOTOSENSITIZED RIBOFLAVIN WITH TMPD AND THE RELATED COMPOUNDS. T. Ogata, H. Kamada, L. J. Berliner, Yamagata University, Yamagata Technopolis and Ohio State University.

- B TRAPPING OF THIYL RADICALS PRODUCED BY PHOTOLYSIS OF DISULPHIDES BY 2,4,6-TRI-TERT-BUTYL NITROSOBENZENE AND 5,5-DIMETHYL-1-PYRROLINE-N-OXIDE. P. Stillman, B. Mile, and C. C. Rowlands, University of Wales College of Cardiff.
- A IN VIVO ESR STUDIES OF NITROSOBENZENE FREE RADICALS FORMED IN WHOLE MICE AND EXCISED MUSCLE AT L- AND X-BAND. B. Zhao, H. Fujii, J. Koscielniak, L. J. Berliner, Ohio State University.
- B ESR STUDIES OF THE SCAVENGING MECHANISMS OF GREEN TEA POLYPHENOLS AND SELENOCARBENAZOLE ON LIPID PEROXIDE FREE RADICALS. J.-C. Zhang, B.-L. Zhao, W.-J. Xin, Academia Sinica, Beijing.
- A THE APPLICATION OF EPR DOSIMETRY FOR RADIOTHERAPY AND RADIATION PROTECTION. R. Kudynski, J. Kudynska, H. A. Buckmaster, Foothills Hospital, Calgary and University of Calgary.
- B SEEPR AND ENDOR STUDY OF CAROTENOID RADICAL CATIONS: SUBSTITUENT EFFECTS. M. Khaled, A. S. Jeevarajan, E. Hand, L. Piekara-Sady, and L. D. Kispert, University of Alabama.
- A EPR OF A FREE RADICAL IN CeO₂: EFFECT OF O₂. M. D. Pace, T. C. Christidis, J. J. Yin, and J. Milliken, National Biomedical ESR Center, Naval Research Laboratory, and American University of Beirut.
- B ELECTRON SPIN RELAXATION FOR C₆₀ ANION. A. J. Schell-Sorokin, A. Viehbeck, F. Mehran, T. R. O'Toole, G. R. Eaton, S. S. Eaton, C. A. Brown, IBM T.J. Watson Research Center, University of Denver, and IBM Almaden Research Center.

- A KINETIC STUDIES OF ALKYL NITRITES IN ALCOHOL SOLVENT BY ELECTRON SPIN RESONANCE SPECTROSCOPY. S.-Shji L. A. Huang, W. H. Lee, W. Y. Liu, Yuan-Tze Institute of Technology, Taiwan.
- B pH DEPENDENCE OF THE FLIP-FLOP RATE OF 5-DOXYL STEARIC ACID IN DIPALMITOYLPHOSPHATIDYL CHOLINE LIPOSOMES. P. D. Morse. II. J.-M. Yuann, Illinois State University.
- A TEMPERATURE- AND ORIENTATION-DEPENDENCE OF ELECTRON SPIN-SPIN RELAXATION RATES FOR Cu(II), Ag(II), AND VANADYL ION. J.-L. Du. K. M. More, G. R. Eaton, and S. S. Eaton, University of Denver.
- B THE DIRECT MEASUREMENT OF SLOW ROTATIONAL CORRELATION TIMES WITH PULSED SATURATION RECOVERY AND ELECTRON-ELECTRON DOUBLE RESONANCE. D. A. Haas, C. Mailer, B. H. Robinson, University of Washington.
- A AN INTERPRETATION OF T_{1e} and T_{2e} IN WIDE LINE MAGNETIC RESONANCE: OBTAINING T_{1e} FROM NITROXIDE SPIN LABELS. B. H. Robinson, C. Mailer, and D. A. Haas, University of Washington.
- B AN EXPLANATION OF THE ELECTRON SPIN-LATTICE RELAXATION RATE AND THE NITROGEN NUCLEAR SPIN-LATTICE RELAXATION RATE OF NITROXIDE SPIN LABELS. C. Mailer, D. A. Haas, B. H. Robinson, University of Washington.
- A Gd³⁺ EPR STUDY OF NH₄Ce(SO₄)₂·4H₂O and NH₄Sm(SO₄)₂·4H₂O SINGLE CRYSTALS: STRUCTURAL PHASE TRANSITIONS AND SYSTEMATICS OF ZERO-FIELD SPLITTING PARAMETER IN Gd³⁺ DOPED ISOSTRUCTURAL NH₄R(SO₄)₂·4H₂O (R = La, Ce, Pr, Nd, Sm, Eu) SINGLE CRYSTALS. S. K. Misra. X. Li, Concordia University.

- B **17O HYPERFINE INTERACTION AND STRUCTURAL DISTORTION STUDIES OF GeO₄ CENTRES IN CRYSTALLINE SiO₂.** R. J. McEachern, J. A. Weil. University of Saskatchewan.
- A **THEORY OF MULTIPLE-QUANTUM EPR.** H. S. Mchaomah. J. S. Hyde, Medical College of Wisconsin.
- B **MULTI-QUANTUM ELECTRON NUCLEAR DOUBLE RESONANCE.** H. S. Mchaurab. T. Christidis, J. S. Hyde, Medical College of Wisconsin.
- A. **MULTIFREQUENCY SATURATION-RECOVERY.** J.-J. Yie. J. S. Hyde, Medical College of Wisconsin.
- B. **PULSED-EPR SPECTROSCOPIC INVESTIGATIONS OF ²H AND ¹H HYPERFINE COUPLING IN THE ORGANIC RADICAL CATALYTIC INTERMEDIATE OF METHYL AMINE OXIDASE.** K. Warncke. D. M. Dooley, G. T. Babcock, J. L. McCracken, Michigan State University.

Wednesday, August 5, 1992

Session VI - Biological Applications

- 8:30 **IN SEARCH OF THE SPIN HAMILTONIAN PARAMETERS OF EXCHANGE COUPLED (Mn(II)) DIMERS: MODELS FOR THE PHOTOSYNTHETIC OXYGEN EVOLVING Mn CLUSTER.** O. Burghaus, V. K. DeRose, M. P. Klein, Lawrence Berkeley Laboratory and Northwestern University.
- 9:00 **PULSED EPR STUDIES OF PHOTOSYNTHETIC OXYGEN EVOLUTION.** R. D. Britt, University of California, Davis.
- 9:30 **EPR INVESTIGATION AND METAL ION ANALYSIS OF THE PROTEIN PHOSPHATASE CALCINEURIN.** F. Rusnak. A. Haddy, S. K-H. Swanson, Mayo Clinic and Foundation.
- 10:00 **BREAK**

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- 10:30 POSSIBLE ROLE OF FREE RADICAL FORMATION IN CLOZAPINE (CLOZARIL)-INDUCED AGRANULOCYTOSIS. R. P. Mason, R. V. Lloyd, V. Fischer, NIEHS and Sandoz Pharma Ltd.
- 11:00 KINETIC STUDY OF CELL RESPIRATION USING NEW OXYGEN-SENSITIVE SOLID STATE EPR PROBES. A. Smirnov, S. W. Norby, R. B. Clarkson, H. M. Swartz, University of Illinois.
- 11:30 CORRELATIONS BETWEEN OXYGEN CONSUMPTION, CYTOCHROME C OXIDASE ACTIVITY, AND NITROXIDE REDUCTION IN NONTRANSFORMED AND ADENOVIRUS-TRANSFORMED BHK CELLS. P. D. Morse, II, L. A. Lucher, J. R. Bobbell, B. Pelz, Illinois State University.
- 12:00 LUNCH

Wednesday, August 5, 1992
Session VII - Biological Applications

- 1:30 SUBTLE INTERACTIONS OF HIRUDIN ANALOGS WITH BOVINE AND HUMAN THROMBIN: ESR AND FLUORESCENCE STUDIES. J. K. Rowand, L. J. Berliner, Ohio State University.
- 1:50 CONFORMATIONAL DIFFERENCES IN NUCLEOTIDE BINDING SITES OF CHLOROPLAST FI-ATPase HEAT-ACTIVATED IN THE PRESENCE OF ADP, ATP OR GTP AS STUDIED WITH SPIN-LABELED ANALOGS. J. H. Nett, P. D. Vogel, W. E. Trommer, Universitat Kaiserslautern.
- 2:10 ESEEM STUDIES OF MEMBRANE-BOUND IRON-SULFUR PROTEINS in situ. J. K. Shergill and R. Cammack, King's College London.
- 2:30 BREAK

Session VUI - Posters, S. S. Eaton, Presiding

3:00 - 4:00 AUTHORS PRESENT FOR POSTERS LABELED C

4:00 - 5:00 AUTHORS PRESENT FOR POSTERS LABELED D

- C ESEEM OF 10 NUCLEI IN METAL-LIGAND COMPLEXES. C. T. Farrar. D. J. Singel, Harvard University.
- D ELECTRON SPINECHO ENVELOPE MODULATION STUDIES OF Cu(II) AND Mo(V)-PTERIN MODEL COMPLEXES. H.-I. Lee. S. J. N. Burgmayer, J. L. McCracken, Michigan State University
- C ESEEM AND ENDOR STUDIES OF THE MULTILINE AND 147 GAUSS RADICAL OF PHOTOS YSTEMII. Michelle Mac. M. Espe, G. T. Babcock, J. McCracken, Michigan State University.
- D S-BAND ANGLE-SELECTED ESE STUDY OF WEAK NITROGEN COUPLING TO Cu(II). W.-J. Shi, R. B. Clarkson, J. B. Cornelius, R. L. Belford, University of Illinois.
- C ESEEM STUDIES OF Co(II) CARBONIC ANHYDRASE. P. C. Kang. S. S. Eaton, G. R. Eaton, University of Denver.
- D ELECTRONIC g-FACTOR MEASUREMENT FROM FIELD-SWEPT ENDOR PATTERNS. W. H. Nelson. J. Shao, Georgia State University.
- C 1 H PULSED ENDOR. C. Fan, P. E. Doan, V. J. DeRose, B. M. Hoffman, Northwestern University.
- D PULSED AND CW ENDOR OF NITRILE HYDRATASE. R. J. Gurbiel, P. E. Doan, H. Jin, M. Nelson, B. M. Hoffman, Northwestern University.
- C GRAPHICAL REPRESENTATIONS OF POLYCRYSTALLINE ENDOR. P. E. Doan, B. M. Hoffman, Northwestern University.

- D DIRECT SIMULATION OF CW-EPR SPECTRA FROM BROWNIAN DYNAMICS TRAJECTORIES. B. H. Robinson, L. J. Slutsky, C. Mailer, F. P. Auteri, University of Washington.
- C MOLECULAR TRAJECTORY EPR SIMULATIONS OF NITROXIDE DYNAMICS AT MULTIPLE FREQUENCIES. F. P. Auteri, D. J. Schneider, J. Busch, R. L. Belford, R. B. Clarkson, University of Illinois.
- D THE EFFECT OF THE NITROGEN NUCLEAR SPIN-LATTICE RELAXATION RATE ON THE SECOND HARMONIC CW SATURATION TRANSFER EPR SPECTRA OF NITROXIDE SPIN LABELS. D. A. Haas, C. Mailer, B. H. Robinson, University of Washington.
- C COMPARISON OF PERFORMANCE OF MEDICAL ADVANCES 4 mm DIAMETER LOOPGAP RESONATOR WITH A TE_{0,2} EPR CAVITY. C. Mailer, D. A. Haas, B. H. Robinson, University of Washington.
- D LIQUID COOLED CWENDOR COIL WITH DIELECTRIC RESONATOR AT 9 GHz OPTIMIZED FOR SMALL AQUEOUS SAMPLES. R. A. Isaacson, G. Feher, University of California - San Diego.
- C OPTIMIZATION OF L-BAND MICROWAVE BRIDGES FOR MAXIMUM SENSITIVITY IN IN-VIVO EXPERIMENTS. J. Koscielniak, L. J. Berliner, Ohio State University.
- D DEVELOPMENT OF SURFACE TYPE LOOP-GAP RESONATOR WITH AN ELECTRIC SHIELD. JL_Q gaja, M. Ono, H. Kamada, Yamagata University and Yamagata Technopolis Foundation.
- C SSB RECEIVING ESR. M. Ono, N. Kobayashi, H. Susaki, K.-C. Hsieh, K. Yokoto, Yamagata University.

- D A LOOP-GAP RESONATOR WITH A HIGHLY UNIFORM MODULATION MAGNETIC FIELD. M. Ono, N. Kobayashi, H. Susaki, K. Hsien, N. Tsuchihashi, T. Ogata, Y. Yamato, K. Iwabuchi, K. Aizawa, T. Sasaki, Yamagata University, Fukushima Medical College, and Yokohu University.
- C VARACTOR TUNING OF THE COUPLING OF EPR RESONATORS TO TRANSMISSION LINES. G. Rinard, R. W. Quine. G. R. Eaton, University of Denver.
- D X-BAND EPR IMAGING OF EDDY CURRENTS. M. Sueki. G. R. Eaton, S. S. Eaton, University of Denver.
- C SIMULATION-AIDED ANALYSIS OF COMPLEX EPR POWDER SPECTRA. L. Gonzalez-Tovany. V. Beltran, Universidad Nacional Autonoma de Mexico.
- D VERY-HIGH-FREQUENCY EPR OF HIGH-SULFUR COAL AND HETEROCYCLIC RADICALS. R. B. Clarkson. W. Wang, F. P. Auteri, P. Kovacs, R. L. Belford, University of Illinois
- C FUSINITE AS A POSSIBLE EPR STANDARD. T. Smirnova. R. B. Clarkson, N. Vahidi, A. Smirnov, R. L. Belford, University of Illinois.
- D THE LOW TEMPERATURE OXIDATION PROCESS IN AN ALBERTA hv BITUMINOUS COAL AS MONITORED USING 9 GHz CW-EPR Mn^{2+} HPS SPECTRAL PARAMETERS. J. Kudynska, H. A. Buckmaster. University of Calgary.
- C THE NON-CENTRAL EPR SPECTRA OF Mn^{2+} IMPURITY IONS IN POLYCRYSTALLINE CALCITE. Y.-P. Zhang, H. A. Buckmaster. University of Calgary.
- D A 9 GHz CW-EPR STUDY OF Mn^{2+} -COMPLEXES IN THE SULPHATE SALTS OF THE TRIDECAMERIC MODIFIED-KEGGHN IONS. J. Kudynska, H. A. Buckmaster, K. Kawano, S. M. Bradley, R. A. Kydd, University of Calgary.

- C THE INTENSITY OF THE EPR SPECTRAL FORBIDDEN TRANSITIONS IN POLYCRYSTALLINE SAMPLES. Y.-P. Zhang, H. A. Buckmaster. University of Calgary.
- D A RELATIVISTIC EFFECTIVE HAMILTONIAN FOR Gd^{3+} ($4f^7, 8s_{7/2}$) IN LATTICES OF VARIOUS SYMMETRIES. H. A. Buckmaster. R. Chatterjee, University of Calgary.
- C CARTESIAN TENSOR NOTATION FOR HIGH-SPIN ELECTRONIC ZEEMAN PARAMETERS. D. G. McGavin, W. C. Tennant. DSIR Chemistry, New Zealand.
- D EPR AND MOSSBAUER SINGLE CRYSTAL EXPERIMENTS INVOLVING LOW SYMMETRY SITES. W. C. Tennant. DSIR Chemistry, New Zealand.

Wednesday evening - Open House, University of Denver,
EPR Laboratory

Thursday, August 6, 1992
Session DC - Techniques

- 8:30 Plenary Lecture MULTI-QUANTUM EPR. J. S. Hvde.
Medical College of Wisconsin.
- 9:15 W-BAND (95 GHz) EPR: INSTRUMENTATION,
APPLICATIONS, AND CALCULATIONS. M. J. Nilges.
R. L. Belford, W. Wang, R. B. Clarkson, University of Illinois.
- 9:50 BREAK
- 10:15 HIGH FIELD EPR (139.5 GHZ) STUDIES OF FREE
RADICAL AND METAL ION BINDING SITES IN
PROTEINS. G. J. Gerfen. S. Un, B. F. Bellew, L. B. Becerra,
D. J. Singel, R. G. Griffin, MIT and Harvard University.
- 10:50 ORGAN SPECIFIC PHARMACODYNAMICS WITH IN $VrVO$
EPR IMAGING. H. J. Halpern. C. Yu, E. Barth, M. Peric,
W. E. Boisvert, M. W. Makinen, S. Pou, G. M. Rosen,
University of Chicago and University of Maryland.

11:25 THE USE OF EPR TO MEASURE TEMPERATURE IN VIVO. H. M. Swartz, K. J. Liu, J. C. Chato, M. W. Grinstaff, K. S. Suslick, Dartmouth Medical School and University of Illinois.

12:00 LUNCH

Thursday, August 6, 1992

Thursday afternoon - Broker user's meeting. Please contact Dr. Art Heiss if you wish to participate.

NOTE: Poster presenters are requested to display their posters from Monday morning to Thursday afternoon to permit time for browsing.

Friday, August 6, 1992 - Workshop on the Future of EPR Instrumentation.

FTIRINIRIRAMAN SPECTROSCOPY SYMPOSIUM
Organized by A.R. Chughtai

Monday, August 3, 1992

8:30 INTRODUCTION. A. R. Chughtai, Chairperson.

8:35 GUEST SPEAKER

THE ART OF ATMOSPHERIC INFRARED MEASUREMENTS. William G. Fatelev, Department of Chemistry, Kansas State University and Editor-in Chief, Applied Spectroscopy, PO Box 688, Manhattan, KS 66502.

9:00 THE EFFECT OF METAL OXIDES AND BLACK CARBON (SOOT) ON **SO₂/O₂/H₂O** REACTION SYSTEMS. Abdul R. Chughtai, Michael E. Brooks, M.S. Akhter, Dwight M. Smith, Department of Chemistry, University of Denver, Denver, CO.

- 9:20 ANALYSIS OF MTBE IN GASOLINE BY INFRARED SPECTROSCOPY. James E. Tackett. Marathon Oil Company, PO Box 269, Littleton, CO 80160.
- 9:40 BREAK
- 10:00 CHEMICAL KINETICS AND PHOTOCHEMISTRY OF LOW CONCENTRATION SOOT/**NO₂/O₂/H₂O** AND SOOT/N₂/S₂/S₂/H₂O/O₂ SYSTEMS. Abdul R. Chughtai, Seth A. Gordon and Dwight M. Smith, Department of Chemistry, University of Denver, Denver, CO.
- 10:25 THE NICOLET RAMAN 910-A DEDICATED NTR-FT RAMAN SPECTROMETER. Ben A. Garland. Fred Walder and Chris Patty. Nicolet Instruments Corporation, 5225 Verona Road, Madison, WI 53711.
- 10:55 THE SCANNING INFRARED MICROPROBE (SIRM) ANALYSIS SYSTEM. Kenneth J. Ward. Spectra-Tech Inc. 652 Glenbrook Road, Stamford, Ct. 06906.
- 11:25 SPECULAR REFLECTION IN THE MID AND FAR INFRARED ADVANTAGES AND LIMITATIONS. W.D. Perkins. The Perkin-Elmer Corporation, 2305 Bering Drive, San Jose, CA 95131.
- 11:45 LUNCH
- Monday, August 3, 1992
- 1:30 SPECTROSCOPIC STUDIES OF DEGRADATION OF ETHYLENE-VINYL ACETATE (EVA) COPOLYMER ENCAPSULANT FOR PV MODULES. FJ. Pern and A. W. Czanderna, Measurement and Characterization Branch, National Renewable Energy Laboratory, 1617 Cole Blvd., Golden, CO 80401.

- 1:55 A SPECTROSCOPIC COMPARISON OF THE SURFACE MORPHOLOGY OF THTN SILVER FILMS ON GLASS AND FORMVAR. Shane E. Roark and Kathy L. Rowlen, Department of Chemistry and Biochemistry, University of Colorado at Boulder, Boulder, CO.
- 2:15 BREAK
- 2:30 RAMAN SPECTROSCOPIC STUDY OF THE SECONDARY STRUCTURE OF AN ANTIFREEZE GLYCOPEPTIDE. Joel A. Drewes and Kathy L. Rowlen, Department of Chemistry and Biochemistry, University of Colorado at Boulder, Boulder, CO.
- 2:55 ENHANCED IR DISCRIMINATION OF INHOMOGENEOUS MINERALS USING AN IMAGING REFLECTANCE MICROPROBE IN A DEEP LEVEL ACOUSTIC PROBE. Steven Hill, BioRad, 237 Putnum Avenue, Cambridge, MA 02139.
- 3:25 THE NEW 3M DISPOSABLE IR CARD FOR QUALITATIVE MID-INFRARED ANALYSIS. James E. Gagnon, 3M DPD-New Products Group; 3M Center, Building 230-3F-O3, St Paul, MN 55144-1000. Neale P. Povey, Jr., 3M MSD Lab., Building 235-2A-05, St. Paul, MN 55144-1000.
- 3:45 MIXED RATIO MEASUREMENTS OF POZZOLONIC BLENDS BY FTIR-ATR METHOD. Teofila V. Rebagay and David A. Dodd. Analytical Operations, Westinghouse Hanford Company, PO Box 1970, Richland, Washington 99352.

SYMPOSIUM ON HAZARDOUS WASTE
Organized by Laura Peitersen

Tuesday, August 4, 1992

- 8:55 OPENING REMARKS. Laura Peitersen.

- 9:00 KEYNOTE SPEAKER: CHEMISTRY AND HAZARDOUS WASTE SITE REMEDIATION: AN INCREASED ROLE FOR CHEMISTS IN EVALUATING THE HAZARD OF SOIL LEAD RESIDUES TO CHILDREN AND TO AQUATIC LIFE. G. Fred Lee, G. Fred Lee & Associates, El Macero, CA.
- 9:45 BREAK
- 10:00 DEALING WITH LABORATORY HAZARDOUS WASTE. Sonia Ringen. University of Wyoming Safety Office, Laramie, WY.
- 10:20 VALIDATION OF A SELECTIVE DISSOLUTION TECHNIQUE FOR DETERMINING THE CHEMICAL FORM OF HEAVY METALS IN CONTAMINATED SEDIMENTS. Keith Rittle and James I. Drever, Department of Geology and Geophysics, University of Wyoming, Laramie, WY.
- 10:50 DEVELOPMENT OF TRANSPORTATION IMPACT ANALYSIS. Shawn Mangum. Wastech Services, Denver, CO.
- 11:20 UTILIZATION OF A GEOGRAPHIC INFORMATION SYSTEM FOR HAZARDOUS WASTE MANAGEMENT. William Gribh and Lawrence Ostresh, Department of Geography and Recreation, University of Wyoming, Laramie, WY.
- 12:00 LUNCH

Tuesday, August 4, 1992
Afternoon Session

- 1:25 OPENING REMARKS. Laura Peitersen.
- 1:30 REMEDIATION OF HYDROCARBON CONTAMINATED SITES. John Ahern. TriHydro, Inc. Laramie, WY.
- 1:50 NATURAL RESOURCE DAMAGE UNDER CERCLA AND THE CLEAN WATER ACT. Michael Hong. Denver, CO.
- 2:40 BREAK

- 2:45 THE FUTURE OF HAZARDOUS WASTE MANAGEMENT. Susan Fields, Western Water Consultants, Inc. Laramie, WY.
- 3:15 OPEN PANEL DISCUSSION ON REGULATORY ASPECTS OF HAZARDOUS WASTE. PANEL MEMBERS INCLUDE: Susan Fields, Civil Engineer, WWC, Inc., Hal Winslow, Winslow and Associates, Mike Hope and Shawn Mangum.
- 4:55 CONCLUDING REMARKS

Wednesday, August 5, 1992

- 8:55 OPENING REMARKS. Laura Peitersen.
- 9:00 KEYNOTE SPEAKER: ENVIRONMENTAL ISSUES IN AMERICAN AGRICULTURE. Thomas A. Colbert, Agricola Environmental Services, Denver, CO.
- 9:45 THE NEW HM-181 REGULATION. Shawn Mangum. Was tech Services, Denver, CO.
- 10:15 BREAK
- 10:25 BIOREMEDIATION. Patricia Colberg. Department of Molecular Biology, University of Wyoming, Laramie, WY.
- 10:55 IMMOBILIZATION OF TOXIC ELEMENTS IN CLEAN COAL TECHNOLOGY BY-PRODUCTS. T.A. Tawfic. Wyoming Water Research Center, Laramie, WY.
- 11:15 RADIOACTIVE AND NONRADIOACTIVE WASTE CHARACTERIZATION AT THE ROCKY FLATS PLANT. Ralph Grover. Rocky Flats.

SYMPOSIUM ON ENVIRONMENTAL IMPORTANCE OF
HUMIC SUBSTANCES
Organized by R.L. Wershaw

Wednesday, August 5, 1992

SPECIAL SYMPOSIUM

A panel of scientists with wide experience in the field of humic substance research will lead a discussion on the interactions of humic substances with organic and inorganic pollutants in natural water systems. The following topics will be discussed:

WHAT ARE HUMIC SUBSTANCES? MODELS OF HUMIC SUBSTANCES. INTERACTIONS OF HUMIC SUBSTANCES WITH METAL IONS. INTERACTIONS OF HUMIC SUBSTANCES WITH HYDROPHOBIC ORGANIC COMPOUNDS.

PANEL MEMBERS:

J.A. Leenheer, is project leader of the Comprehensive Organic Analyses Project, U.S. Geological Survey.

R.L. Malcolm, is project leader of the Organic Hydrogeochemistry Project, U.S. Geological Survey.

Patrick MacCarthy, is professor of chemistry at the Colorado School of Mines.

R.L. Wershaw, is project leader of the Organic Polyelectrolyte Project, U.S. Geological Survey.

These panelists have had extensive experience in the isolation and characterization humic substances, and the measurement of their interactions in natural water systems. The panelists will each make a short presentation after which the audience will be invited to comment and to add to the material presented.

SYMPOSIUM OF INDUCTIVELY COUPLED PLASMA-
MASS SPECTROMETRY

Organized by Howard E. Taylor

Wednesday, August 5, 1992

Howard E. Taylor, Presiding

- 1:00** UTILIZATION OF INDUCTIVELY PLASMA-MASS SPECTROMETRY AS A DETECTOR FOR SEDIMENTATION FIELD-FLOW FRACTIONATION. Howard E. Taylor and John R. Garbarino, U.S. Geological Survey, Boulder, CO and Ron Beckett, Monash University, Melbourne, Australia.
- 1:20** AUTOMATED QUALITY CONTROL SOFTWARE FOR ICP OPTICAL EMISSION AND ICP MASS SPECTROMETRY. Cindy Anderau, Robert Thomas and Randy Hergenreder, Perkin-Elmer Corporation, Norwalk, CT.
- 1:40** EXTENSION OF ICP-MS DYNAMIC RANGE BY SIMULTANEOUS DETECTION IONS AND OPTICAL EMISSIONS. Steve Govorchin, Serapio Ayala, Sarah McGinty and Steven Hughes, Bandgap Technology, Broomfield, CO.
- 2:00** ANALYSIS OF DIFFICULT MATRICES USING HIGH RESOLUTION ICP-MS. John Castle, Amanda Walsh and Rob Henry, Risons Investments, Fredericksburg, VA.
- 2:20** BREAK
- 2:40** DETECTION OF RARE EARTH ELEMENTS BY ICP-HRMS. K. Otsuka, M. Iwanaga and B. Musselman, JEOL, LTD. Akishima, Japan.
- 3:20** THE ANALYSIS OF GRANITES AND RHYOLITES BY LASER ABLATION ICP-MS. F.E. Lichte, U.S. Geological Survey, Lakewood, CO.
- 3:40** A Q-SWITCHED ND:YAG LASER PROBE FOR ICP-MS ANALYSIS. Rob Henry, Ian Abell and Ed McCurdy, Fisons Instruments, Fredericksburg, VA.

SYMPOSIUM ON LUMINESCENCE

Organized by DeLyle Eastwood and Robert J. Hurtubise

Monday, August 3, 1992

- 8:55 INTRODUCTORY REMARKS. DeLyle Eastwood.
- 9:00 LUMINESCENCE PARAMETERS AND RATE CONSTANTS OF THE TETROLS OF BENZO(A)PYRENE-DNA ADDUCTS ON 10%-CYCLODEXTRIN/NaCl MIXTURES. Johannes Corley and Robert J. Hurtubise, Department of Chemistry, University of Wyoming, Laramie, WY 82071.
- 9:50 EXTRINSIC PROBE STUDIES OF THE LIPID-RELATED LUMINESCENCE OF HUMAN SERUM. Robert D. Stevens and Linda B. McGown, Department of Chemistry, Duke University, Gross Chemical Laboratory, Durham, NC 22706.
- 10:15 BREAK
- 10:45 FLUORIMETRIC DETERMINATION OF OPERATIONAL pH IN AQUEOUS METHANOL. Stephen G. Schulman and Robert Townsend, Department of Medicinal Chemistry, University of Florida, Gainesville, FL 32610-0485.
- 11:10 FLUORESCENCE ENERGY TRANSFER IN FRACTALS AND RESTRICTED GEOMETRIES. T. Gregory Dewey, Department of Chemistry, University of Denver, Denver, CO 80208.
- 11:35 SOLID-MATRIX LUMINESCENCE PROPERTIES OF THE GUANINE ADDUCT OF BENZO(A)PYRENE ABSORBED ON α -, β -, γ -CYCLODEXTRIN/NaCl AND TREHALOSE/NaCl SOLID MATRICES. Yu Chu and Robert J. Hurtubise, Department of Chemistry, University of Wyoming, Laramie, WY 82070.
- 12:00 LUNCH

Monday, August 3, 1992

Robert J. Hurtubise, Presiding

- 2:00 TIME-RESOLVED FLUORESCENCE ENERGY TRANSFER USING A Tb CHELATE DONOR. Scott Saavedra and Sylvia Kolchens, Department of Chemistry, University of Arizona, Tucson, AZ 85721.
- 2:25 EVALUATION OF PHOTOINITIATED PEROXYOXALATE CHEMILUMINESCENCE IN POLYACRYLAMIDE GELS. Andreas H.J. Crompting, Robert E. Milsky and John W. Birks, Department of Chemistry and Biochemistry and Cooperative Institute for Research in Environmental Sciences (CIRES), University of Colorado, Boulder, CO 80309-0216.
- 2:50 PHOSPHORESCENCE QUENCHING OF TETROLS AT VARIOUS HUMIDITIES IN SOLID-MATRIX PHOSPHORESCENCE. S. Wei Tijoe and Robert J. Hurtubise. Department of Chemistry, University of Wyoming, Laramie, WY 82071.
- 3:15 COMPARISON OF SOLUTION LUMINESCENCE AND SOLID-MATRIX LUMINESCENCE DATA IN MECHANISTIC AND ANALYTICAL STUDIES. Robert J. Hurtubise and S.M. Ramasamy. Department of Chemistry, University of Wyoming, Laramie, WY 82071.
- 4:10 CONCLUDING REMARKS. Robert J. Hurtubise.

Mass Spectrometry Symposium
Organized by Joseph A. Zirrolli and Steve Zaugg

Monday, August 3, 1992

- 8:30 KEYNOTE SPEAKER: RECENT ADVANCES IN FOUR-SECTOR TANDEM MASS SPECTROMETRY: APPLICATION TO BIOMOLECULES. Michael Gross. Department of Chemistry, University of Nebraska, Lincoln, NE 68588.

- 9:20 IDENTIFICATION OF NOVEL METABOLITES OF LEUKOTRIENE B₄. Robert C. Murphy, Department of Pediatrics, National Jewish Center for Immunology and Respiratory Medicine, Denver, CO 80206.
- 9:50 EXTENSIVE STRUCTURAL ANALYSIS BY MASS SPECTROMETRY OF THE MYCOLYLARABINOGALACTAN OF THE MYCOBACTERIUM TUBERCULOSIS ALLOWS THREE-DIMENSIONAL MODELS OF THE M. TUBERCULOSIS CELL WALL TO BE PROPOSED. Michael McNeil and Patrick Brennan, Department of Microbiology, Colorado State University, Ft. Collins, CO 80523.
- 10:20 BREAK
- 10:35 STUDIES OF SERUM FERRITIN BY ELECTROSPRAY LC/MS. D. Dvckes, C. Campbell, K. Veisbein and M. Dumovic, Department of Chemistry, University of Colorado, Denver, CO.
- 11:05 THERMOSPRAY LC/MS ANALYSIS OF PROTEIN ADDUCTS OF ELECTROPHILIC METABOLITES. Sherri B. Turnipseed, Judy L. Bolton and John A. Thompson, School of Pharmacy, University of Colorado, Boulder, CO 80309.
- 11:35 MASS SPECTROMETRY IN NUTRITION RESEARCH. Paul V. Fennessey, David Flory and Leland V. Miller, Department of Pediatrics, University of Colorado Health Sciences Center, Denver, CO 80262.
- 12:05 LUNCH & EXHIBITION
- Monday, August 3, 1992
- 1:30 GAS PHASE ACIDITIES OF ALPHA-AMINO ACIDS. Richard A. J. O Hair, John H. Bowie and Scott Gronert, Department of Organic Chemistry, University of Adelaide, Adelaide, Australia and Department of Chemistry and Biochemistry, University of Colorado, Boulder, CO 80309-0215.

- 2:00 THE GAS PHASE ACIDITY OF HINDERED AMINES AND SOME REACTION CHEMISTRY OF THEIR CORRESPONDING AMIDE IONS. Michele Krempp, Richard O Hair, Robert Damrauer and Roger A. Simon, Department of Chemistry & Biochemistry, University of Colorado, Boulder, CO 80309-0215 and Department of Chemistry, University of Colorado, Denver, CO.
- 2:30 A DEATATLED INVESTIGATION OF THE GAS PHASE PROTON ABSTRACTION REACTION BETWEEN HYDROXIDE ION AND ACROLEIN. Marin S. Robinson, Fred W. Breitbeil, III and Charles H. DePuy, Department of Chemistry & Biochemistry, University of Colorado, Boulder, CO 80309-0215, and Department of Chemistry, DePaul University, Chicago, IL 60614
- 3:00-5:00 EXHrBITION
- Tuesday, Ausust 4, 1992
- 8:30 FINNIGAN CORPORATION INVITED SPEAKER. THE FUTURE OF QUADRUPOLE MASS SPECTROMETERS. Gary L. Glish, Department of Chemistry, University of North Carolina, Chapel Hill, NC.
- 9:20 EVALUATION OF AN ELECTROSTATIC ANALYZER BASED TTME-OF-FLIGHT MASS SPECTROMETER. Robert S. Brown, N. Lynn Gilfrich, John J. Lennon, Scott S. and Donald L. Dick, Chemistry Department, Colorado State University, Ft. Collins, CO 80525.
- 9:50 INEXPENSIVE AND ROUTINE BENCHTOP MASS SPECTROMETER FOR SFC/EI-MS APPLICATIONS. Verl Murugaverl, Kent J. Voorhees and Ahmad Ghaaibeh, Department of Chemistry & Geochemistry, Colorado School of Mines, Golden, CO 80401.
- 10:20 BREAK

- 10:35 DYNAMIC FAB MASS SPECTROMETRY OF METAL COMPLEXES. R.M. Barkley. Department of Chemistry & Biochemistry, University of Colorado, Boulder, CO 80309-0215.
- 11:05 APPLICATION OF PROBE MICRODISTILLATION LOW VOLTAGE-HIGH RESOLUTION MASS SPECTROMETRY FOR THE CHARACTERIZATION OF ORGANOSULFUR CONSTITUENTS IN HIGH SULFUR COALS. Garret A. Veloski, Ronald J. Lynn, Richard F. Sprecher and Curt M. White, United States Department of Energy, Pittsburgh Energy Technology Center, PO Box 10940, Pittsburgh, PA 15236.
- 11:35 EXHIBITION & LUNCH

Tuesday, August 4, 1992

- 1:30 STRUCTURAL ANALYSIS OF HYDROXY, UNSATURATED FATTY ACIDS BY TANDEM MASS SPECTROMETRY. Pal Wheelan. Joseph A. Zirrolli and Robert C. Murphy, Department of Pediatrics, National Jewish Center for Immunology and Respiratory Medicine, Denver, CO 80206.
- 2:00 ANALYSIS OF OXIDIZED PHOSPHOLIPIDS BY FAB MS/MS. Kathleen Kayganich. David Rose and Robert C. Murphy, Department of Pediatrics, National Jewish Center for Immunology and Respiratory Medicine, Denver, CO.
- 2:30 PEPTIDE SEQUENCE DETERMINATION BY TRIPLE SECTOR QUADRUPOLE MASS SPECTROMETRY. Denise MacMillan. Keith L. Clay, Frank A Fitzpatrick and Robert C. Murphy, Department of Pediatrics, National Jewish Center for Immunology and Respiratory Medicine, Denver, CO 80206.
- 3:00 FACILE DETERMINATION OF ALKYL-BRANCHED FATTY ACID METHYL ESTERS BY TANDEM MASS SPECTROMETRY. Joseph A. Zirrolli. Department of Pediatrics. National Jewish Center for Immunology and Respiratory Medicine, Denver, CO 80206.
- 3:30-5:00 EXHIBITION

NMR SYMPOSIUM

Organized by: *R. Botto, H. Eckert, J. Garbow, H. Thomann,
A.J. Vega, and J. P. Yesinowski*

**SYMPOSIUM TO HONOR BERNIE GERSTEIN ON THE
OCCASION OF HIS RETIREMENT**

Monday, August 3, 1992

H. Eckert, Presiding

- 8:25 WELCOMING REMARKS. H. Eckert.
- 8:30 TO BE ANNOUNCED. T.T.P. Cheung. Phillips Petroleum Company, Bartlesville, OK.
- 9:00 PROBING POLYMER MORPHOLOGY WITH XENON NMR. Po-Jen Chu, T. T. P. Chueng, and G. L. Wilkes, Phillips Petroleum Company, Bartlesville, OK.
- 9:30 **¹²⁹XE** NMR OF ADSORBED MO SUBCARBONYLS. Cathy Tway and Thomas. M. Apple. Rensselaer Polytechnic Institute, Troy, N.Y.
- 10:00 BREAK
- 10:30 WHAT IS A TYPICAL DIPOLAR COUPLING CONSTANT IN A SOLED? Serge Lacelle. Universite de Sherbrooke, Sherbrooke, Quebec, Canada.
- 11:00 THE GERSTEIN EFFECT: THERMODYNAMICS AND NMR. Cecil R. Dvbowski. M. A. Hepp, and M. L. Smith, University of Delaware.
- 11:30 NMR, IR, AND DIELECTRIC STUDIES OF WATER IN THE CHANNELS OF BERYL. Alexander. J. Vega. Robert D. Shannon, and George. R. Rossman, Dupont Central Research and Development, Wilmington DE

12:00 CHARACTERIZATION OF SURFACE PHENOMENA ON SUPPORTED METALLIC CATALYSTS BY SOLID STATE NMR OF ^1H AND ^{13}C AND FTIR SPECTROSCOPY. Marek Pruski, Teny S. King, and Bernard C. Gerstein, Iowa State University, Ames, IA.

Monday, August 3, 1992:

SPIN DYNAMICS AND NEW EXPERIMENTAL TECHNIQUES

J. P. Yesinowski, Presiding

- 2:00 NEW ANGLES IN DYNAMIC MAGIC ANGLE SPINNING NMR. P. J. Grandinetti, Y. K. Lee, J. H. Baltisberger, A. Llor, and A. Pines, UC Berkeley, CA.
- 2:30 TWO-DIMENSIONAL NMR WITH VARIABLE ANGLE SPINNING. Lucio Frydman, Gerard C. Chingas, Young K. Lee, Philip J. Grandinetti, Margaret A. Eastman, Geoffrey A. Barral, and Alexander Pines, UC Berkeley, CA.
- 3:00 RETRIEVAL OF QUADRATURE PHASE INFORMATION FROM CRAMPS EXPERIMENTS. Lai ma M. Baltusis and Thomas. M. Barbara, Varian Associates, Palo Alto CA.
- 3:30 BREAK
- 4:00 THE DETECTION OF WEAK HETERONUCLEAR COUPLING BETWEEN $1=1$ AND $1=1/2$ NUCLEI IN MASNMR; $^{\text{TM}}\text{W}^{\text{C}}$ DOUBLE RESONANCE EXPERIMENTS. Clare P. Grey and Wiebren S. Veeman, Dupont Central Research and Development, Wilmington, DE and University of Nijmegen, Nijmegen, The Netherlands.
- 4:30 MEASUREMENT AND INTERPRETATION OF INDIRECT SPIN-SPIN COUPLINGS IN THE SOLID STATE. Roderik Wasylshen, Dalhousie University.
- 5:00 CHEMICAL SHIFT ANISOTROPY: TROUBLEMAKER OR SUPPLIER OF INFORMATION? Amdt-Rudiger Grimmer, WTP-KAI, e.V., Berlin Germany.

Tuesday, August 4, 1992

R. W. VAUGHAN PLENARY LECTURE H. Eckert, Presiding

8:30 ROTATIONAL RESONANCE AND RF DRIVEN
RECOUPLING: HOMNUCLEAR DISTANCE
MEASUREMENTS IN SPINNING SOLIDS. Robert. G. Griffin.
MIT, Cambridge, MA.

BIOLOGICAL SOLIDS I J. R. Garbow, Presiding

9:30 ROTATIONAL RESONANCE NMR STUDIES OF
MEMBRANE-BOUND PEPTIDES. Steven O. Smith. Olve.
Peersen and Saburo Aimoto, Yale University, New Haven, CT and
Institute for Protein Research, Osaka, Japan.

10:00 BREAK

10:30 MAGIC-ANGLE SPINNING NMR STUDIES OF MOLECULAR
ORGANIZATION IN MODEL SUBSTRATE MIXTURES FOR
GLYCERIDE DIGESTION. Ruth E. Stark. K. L. Li, and C. A.
Tihal, College of Staten Island, Staten Island, N. Y.

11:00 SOLID STATE NMR STUDIES OF ENZYME BINDING SITES.
A. M. Christensen and J. Schaefer, Washington University, St.
Louis, MO.

11:30 MEMBRANE-BOUND POLYPEPTIDE STRUCTURE AND
DYNAMICS BY SOLID STATE NMR. Tim Cross. University of
Florida

Tuesday, August 4, 1992

BIOLOGICAL SOLIDS II J. R. Garbow, Presiding

1:30 CONFORMATIONS OF PEPTIDES AND PROTEINS BY " c -
 ^{15}N REDOR NMR SPECTROSCOPY. Joel R. Garbow and
Charles A. McWherter, Monsanto Company, St. Louis MO.

2:00 MULTIDIMENSIONAL ZERO-FIELD NMR SPECTROSCOPY
OF PROTEINS. M. H. Liao, R. Subramanian, R. Templin, and
Gerard Harbison. SUNY Stony Brook.

2:30 NMR STUDIES OF MACROMOLECULAR STRUCTURE AND DYNAMICS. Gary Drobney, University of Washington, Seattle WA.

3:00 BREAK

SOLID STATE IMAGING R. Botto, Presiding

3:30 NMR IMAGING AND THE RHEOLOGY OF SUSPENSIONS. Steven W. Sinton, Joseph H. Iwamiya, and Andrea W. Chow, Lockheed Missiles and Space Company, Palo Alto, CA.

4:00 STUDIES OF SINGLE AND MULTIPHASE FLOWS BY NMR. Eiichi Fukushima et al., Lovelace Medical Foundation, Albuquerque, NM.

4:30 SPIN INTERACTIONS AT INTERFACES; EFFECTS AND ARTIFACTS IN NMR MICROSCOPY. E. McFarland and D. Lee, UC Santa Barbara, CA.

5:00 SOLID STATE NMR IMAGING OF POLYMERS. J. B. Miller, A. N. Garroway, and D. G. Cory, Naval Research Laboratory, Washington DC.

Wednesday, August 5, 1992

CATALYSIS AND CATALYTIC MATERIALS

A. J. Vega, Presiding

8:30 TO BE ANNOUNCED. Y. Wu, University of North Carolina, Chapel Hill, NC.

9:00 NMR STUDIES OF OVERLAYERS ON GRAPHITE: CD₄ AND XE ON GRAPHITE FOAM. G. T. Went and T. M. Duncan, Cornell University, Ithaca, NY.

- 9:30 TOWARDS A SYSTEMATIC CHEMISTRY OF ZEOLITE CATALYSIS. James F. Haw, Eric J. Munson, Larry W. Beck, Ali A. Khier, David K. Murray, Jih-Wen Chang, Jeffery L. White, Teng Xu, and David B. Ferguson, Texas A&M University, College Station, TX.
- 10:00 BREAK
- 10:30 EXPERIMENTAL METHODS FOR MAS NMR STUDIES OF REACTIVE SPECIES. David B. Ferguson, Eric J. Munson, Larry W. Beck, Gregory W. Oliver, Jeffery L. White and James F. Haw, Texas A&M University, College Station, TX.
- 11:00 SURFACE CHEMISTRY OF CO ON PD, RU, AND CU-PD VIA HIGH RESOLUTION SOLUTION STATE NMR. John M. Millar, John S. Bradley, Ernestine W. Hill, and Debra A. Lemp, Exxon Research and Engineering, Annandale, NJ.
- 11:30 ¹³C NMR STUDY OF CO ADSORBED ON SUPPORTED PD PARTICLES TO CHARACTERIZE COADSORPTION EFFECT AND MORPHOLOGY CHANGE. OcHeeHan, Kurt W. Zilm, Gustavo Larsen, and Gary L. Haller, Yale University, New Haven, CT.

Wednesday, August 5, 1992

Session I

CARBONACEOUS MATERIALS AND POLYMERS

R. Botto Presiding

- 1:30 HIGH RESOLUTION ¹H AND ¹³C SOLID STATE NMR STUDIES OF MESOPHASE FORMATION FROM BROWN COAL DERIVED PITCH. John W. Hanna, Anthony M. Vassallo, and Andrew J. Palmisano, CSIRO, Australia.
- 2:00 LARGE SAMPLE VOLUME ROTOR SYSTEM FOR BLOCH DECAY NMR EXPERIMENTS ON COAL. Yi Jin Jiang, Mark S. Solum, Ronald J. Pugmire, and David M. Grant, University of Utah, Salt Lake City, UT.

- 2:30 NMR SPECTROSCOPIC STUDIES OF COAL AND ITS LIQUEFACTION PRODUCTS. W. D. Provine, M. A. Jacintha, M. T. Klein, W. H. Calkins, and Cecil Dvbowski, University of Delaware, Newark DE.
- 3:00 BREAK
- 3:30 NMR STUDIES OF CHEMICAL VAPOR DEPOSITED DIAMOND FILM. Herman Lock, Gary E. Maciel, Colorado State University, Fort Collins, CO and Curtis E. Johnson, Naval Air Warfare Center, China Lake, CA.
- 4:00 *H NMR OF POLYCRYSTALLINE DIAMOND FILMS. Karen M. McNamara, David H. Levy, and Karen K. Gleason, MIT, Cambridge, MA.
- 4:30 CHARACTERIZATION OF MOLECULAR ORIENTATION IN POLYMERIC THIN FILMS AND FIBERS USING MULTIDIMENSION DECODER NMR EXPERIMENTS. Brad F. Chmelka, Klaus Schmidt-Rohr, and Hans Wolfgang Spiess, University of California, Santa Barbara, CA, and Max Planck Institute for Polymerforschung, Mainz, Germany.
- 5:00 IDENTIFICATION OF POLY(PHENYLENE SULFIDE) END GROUPS BY SOLID STATE μ c NMR. Maziar Sardashti, Stephen M. Wharry, Daniel J. O'Donnell, Paul J. DesLauriers, and Paritosh K. Das, Phillips Petroleum Company, Bartlesville, OK.

August 5, 1992,

Session II

INORGANIC SEMICONDUCTORS J.P. Yesinowski, presiding

- 1:30 MULTINUCLEAR NMR STUDY OF THE ALLOY SEMICONDUCTOR HG_{0.7}gCD_{0.22}TE. D. B. Zax, S. Vega and D. Zamir, Cornell University, Ithaca, N. Y. and Weizmann Institute, Rehovot, Israel.

- 2:00 COMPARISON OF THE INTERNUCLEAR DISTANCES IN CRYSTALLINE AND AMORPHOUS CD_3P_2 BY MAGIC ANGLE SPINNING SOLIDS NMR. Susan Holl and Jacob Schaefer, Washington University, St. Louis.
- 2:30 DIPOLAR MAS NMR STRATEGIES FOR STRUCTURAL STUDIES OF TETRAHEDRAL SEMICONDUCTORS. Hellmut Eckert and Deanna Franke, UC Santa Barbara, CA.
- 3:00 BREAK
- INORGANIC MATERIALS STRUCTURE AND DYNAMICS
H. Eckert, presiding
- 3:30 CHARACTERIZATION OF ADVANCED CERAMICS BY MULTINUCLEAR SOLID STATE MAGNETIC RESONANCE. Mark E. Smith and Timothy J. Bastow, CSIRO Australia.
- 4:00 WIDELINE PROTON NMR AND STRUCTURAL IMPLICATIONS FOR TWO NATURAL ZEOLITES: CLINOPTILOLITE AND HEULANDITE. Raymond L. Ward and H. Lawrence McKague, Lawrence Livermore Laboratory, Livermore, CA.
- 4:30 CLAY STRUCTURES INVESTIGATED BY SOLID STATE **19F** NMR. Young Wah Kim. Andrea Labouriau, Steve J. Chipera, David L. Bish, and William L. Earl, Los Alamos National Laboratory, Los Alamos, NM.
- 5:00 MOLECULAR MERRY GO-ROUNDS; WHOLE MOLECULE REORIENTATION OF CROWN ETHERS IN THEIR SOLID COMPLEXES. C. I. Ratcliffe. J. A. Ripmeester, National Research Council of Canada, Ottawa, Canada.

Thursday, August 6, 1992
SPIN DYNAMICS AND NEW EXPERIMENTAL
TECHNIQUES II H. Thomann, presiding

- 8:30 NMR STUDIES OF SINGLE CRYSTAL AND POWDER SAMPLES OF TRANSITION METAL DIHYDROGEN COMPLEXES. Linda Wisniewski and Kurt Zilm, Yale University, New Haven, CT.
- 9:00 DRAMATIC NMR APPROACH TO STRUCTURE DETERMINATION IN SOLIDS. Robert Tvcko, AT&T Bell Laboratories, Murray Hill, NJ.
- 9:30 STUDY OF QUADRUPOLEAR PARAMETERS BY DAS AND DOR IN VARIABLE MAGNETIC FIELDS. Raz Jelinek, J. H. Baltisberger, Karl T. Mueller, and Alexander Pines, UC Berkeley, CA.
- 10:00 BREAK
- NMR OF IMPRISONED SPINS
H. Thomann, presiding
- 10:30 DETAILS OF STRUCTURE AND DYNAMICS OF THE HYDROXYL GROUPS OF SILICA AS STUDIED BY ¹H AND ²⁹SI NMR. David R. Kinney, I-Ssuer Chuang, and Gary E. Maciel, Colorado State University, Fort Collins, CO.
- 11:00 NMR AS A PROBE OF THE PORE SPACE GEOMETRY AND FLUID DYNAMICS IN POROUS MEDIA. Michael Herold and Hans Thomann, Exxon Corporate Research, Annandale, NJ.
- 11-30 PHASE ENCODED CHEMICAL SHIFT IMAGING OF FLUIDS IN POROUS MEDIA. Chii T. Chang and Karl M. Edwards, Texas A&M University, College Station, TX.
- 12:00 NMR RELAXATION IN POROUS ROCK. Robert Kleinberg, Schlumberger-Doll, NJ.

SYMPOSIUM OF PHARMACEUTICAL ANALYSTS

Organized by Robert K. Lantz and Patricia L. Sulik

Wednesday, August 5, 1992

- 8:25 WELCOME AND INTRODUCTION OF KEYNOTE SPEAKER.
R. K. Lantz.
- 8:30 KEYNOTE SPEAKER: CORRELATION BETWEEN
DISSOLUTION TESTING AND BIOAVAILABILITY. EU
Shelter. Department of Pharmacy, University of Colorado.
- 9:30 NUTS AND BOLTS OF DISSOLUTION TESTING. Mike
Pasolinko. Van Kel, Inc.
- 10:30 BREAK
- 10:50 MASS SPECTROMETRY IN DRUG METABOLISM STUDIES.
Paul Fennessay. University of Colorado, Health Sciences Center.
- 11:50 LUNCH

Wednesday, August 5, 1992

- 1:30 GC/MS ANALYSIS OF A NEW CORTICOSTEROID. Paul
Fennessay and Adrian Pike. University of Colorado, Health
Sciences Center.
- 1:50 ANALYSIS OF THALIDOMIDE IN PHARMACEUTICAL
DOSAGE FORMS. Robert K. Lantz. Patricia L. Sulik, RML,
Inc.
- 2:10 MICROWAVE HYDROLYSIS OF PROTEIN AND PEPTIDES
FOR AMINO ACID ANALYSIS. W. Gary Eneelhart. CEM
Corporation.
- 2:30 BREAK

- 2:45 AN ISOCRATIC HPLC METHOD FOR ANALYSIS OF SIX NONSTEROIDAL ANTIINFLAMMATORY DRUGS. Brian K. Low, Randy M. McEvoy, Paul C. Reinhart, Atrix Laboratories.
- 3:05 AUTOMATED DISSOLUTION TESTING WITH ION CHROMATOGRAPHIC ANALYSIS OF POTASSIUM CHLORIDE EXTENDED RELEASE TABLETS. Jeanne B. Li, Dennise Kent, Millipore, Waters Chromatography.
- 3:25 ELECTROSPRAY IONIZATION ADVANCES IN PHARMACEUTICAL AND BIOLOGICAL ANALYSIS. Mark Uhrich, Ian Jardine, Ken Johnson, Mark Hail, Iain Mylchreest, Joe Zhou. Finnigan MAT.

*1992 Quality Assurance Symposium
Organized by William Shampine and Victor Janzer*

Tuesday, August 4, 1992

- 8:25 WELCOME AND INTRODUCTORY REMARKS
- 8:30 PRECISION IN ANALYTICAL MEASUREMENTS: EXPECTED VALUES AND CONSEQUENCES IN GEOCHEMICAL ANALYSES. William Horwitz and Richard Albert, U.S. Food and Drug Administration, Washington, D.C.
- 9:00 THE CALCULATION OF METHOD DETECTION LIMITS: AN ALTERNATIVE PROCEDURE USING MULTIPLE SAMPLE DUPLICATES. Kenneth E. Osborn and Arnold E. Greenberg, East Bay Municipal Utility District, Oakland, California.
- 9:30 PRECISION OF WET ATMOSPHERIC DEPOSITION DATA DETERMINED WITH COLLOCATED SAMPLERS. Mark A. Nilles, LeRoy J. Schroder, and John D. Gordon, U.S. Geological Survey, Golden, Colorado.
- 10:00 BREAK

10:30 USE OF PERFORMANCE EVALUATION SAMPLES IN ASSESSING ENVIRONMENTAL DATA QUALITY. Peggy Zawodny and Diann Simms Diwight, U.S. Environmental Protection Agency, Annapolis, Maryland.

11:00 DATA USABILITY FOR RISK ASSESSMENT. Ruth Blevler. U.S. Environmental Protection Agency, Washington, D.C.

11:30 LUNCH

Tuesday, August 4, 1992

1:00 THE ROLE OF QUALITY ASSURANCE IN CLP COMPLIANCE. Diane Bradway. U.S. Environmental Protection Agency, Denver, Colorado.

1:30 CONTRACT LABORATORY PROGRAM (CLP), QUALITY ASSURANCE/EVIDENTIARY AUDITING PROGRAM - AN OVERVIEW. Michael L. Hurd. U.S. Environmental Protection Agency, Washington, D.C.

2:00 BREAK

2:30 DEVELOPMENT OF QA/QC SAMPLES FOR USE IN ARSENIC AND SELENIUM DETERMINATIONS IN ENVIRONMENTAL SAMPLES IN THE WESTERN U.S. William J. Walker. University of California-Davis, and Marvin Yates, U.S. Geological Survey, Sacramento, California.

3:00 THE EFFECT OF FILTER MEMBRANE SELECTION ON TRACE METAL DETERMINATIONS IN DRINKING WATER, Gregory K. George. Technology Applications, Inc, c/o U.S. Environmental Protection Agency, Cincinnati, Ohio.

3:30 EVALUATION OF METHODS USED FROM 1982 TO 1992 TO DETERMINE ARSENIC, CADMIUM, AND IRON IN USGS REFERENCE WATER SAMPLES. H. Keith Long. U.S. Geological Survey, Golden, Colorado

Wednesday, August 5, 1992

- 8:25 WELCOME AND INTRODUCTORY REMARKS
- 8:30 INTERNAL AUDITING FOR QUALITY ASSURANCE. Steve Baugh, Analytica Inc., Golden, Colorado.
- 9:00 BUILDING FLEXIBILITY INTO A QUALITY ASSURANCE PLAN. Timothy L. Fisher, U.S. Army Environmental Hygiene Agency, Aberdeen, Maryland.
- 9:30 QUALITY ASSURANCE IN THE BRANCH OF GEOCHEMISTRY, USGS. Belinda Arbogast, U.S. Geological Survey, Denver, Colorado.
- 10:00 BREAK
- 10:30 CONSIDERATIONS FOR CERTIFICATION RENEWAL OF A LIQUID WAVELENGTH STANDARD REFERENCE MATERIAL FOR UV/VISIBLE SPECTROPHOTOMETRY. Jerry D. Messman, Melody V. Smith, Nancy K. Winchester, National Institute of Standards and Technology, Gaithersburg, Maryland.
- 11:00 THERMAL ANALYSIS OF BIKN03 AND TI/B ADMIXTURES. Albert S. Tompa, Robert F. Boswell, and James E. Rose, Naval Surface Warfare Center.
- 11:30 CONCLUDING REMARKS
- 12:00 LUNCH

Wednesday, August 5, 1992

- 2:00-4:00 PANEL - WASTE DISPOSAL - THE KEY TO AN EFFECTIVE QUALITY ENVIRONMENT?

LABORATORY TOTAL QUALITY MANAGEMENT
Organized by Earle A. Lewis

Monday, August 3, 1992

- 8:00 OPENING REMARKS. Earle A. Lewis.
- 8:15 CAN WE BE RIGHT THE FIRST TIME? Lynn F. James, USDA-Agricultural Research Service.
- 8:45 ANALYTICAL TURNAROUNDS. MOMENTS OF TRUTH. John G. Huntington and Ellen E. Drew, Phoenix Analytical Laboratories.
- 9:15 BREAK
- 9:45 TO BE ANNOUNCED. Mary Cast. U.S. Geological Survey.
- 10:15 TO BE ANNOUNCED. James Waite. Precision Scientific.
- 10:45 TO BE ANNOUNCED. Francis Plaisek. Storage Technology.
- 11:15 TO BE ANNOUNCED. Jeannette Rogers. MetPath Laboratories.
- 11:45 LUNCH
- 2:00 PANEL - THE APPLICATION OF TQM PRINCIPLES IN A LABORATORY ENVIRONMENT

SYMPOSIUM ON LABORATORY ROBOTICS
Organized by Richard L. Pfeiffer

Wednesday. August 5, 1992

- 8:25 INTRODUCTORY REMARKS. R.L. Pfeiffer.
- 8:30 FILTRATION OF WATER SAMPLES USING 3 DIFFERENT ROBOTIC PROCEDURES. G.L. Hoffman and J. W. Fahy, US Geological Survey, Arvada, CO.

- 9:00 AUTOMATION OF HERBICIDE EXTRACTION FROM SOIL USING A LABORATORY ROBOTICS SYSTEM. L. J. Jarvis and W. C. Koskinen. USDA/ARS, St. Paul MN.
- 10:00 BREAK
- 10:30 DATA VERSES INFORMATION IN THE AUTOMATED LABORATORY. S. R. Metzner. Monsanto Company, St. Louis, MO.
- 11:00 WORK STATION BASED LABORATORY AUTOMATION FOR THE ENVIRONMENTAL LABORATORY. J. Helfrich. Zymark Corporation, Hopkinton, MA.

POSTERS

TITLES AND AUTHORS

Organized by Mary Cast

COLORIMETRIC ANALYSIS OF SELENIUM IN PREMIXES - RESULTS OF RUGGEDNESS TESTS. Jeffrey Hurlbut, Roger G. Burkepile and Carolyn A. Geisler.

GAS CHROMATOGRAPHIC ANALYSIS OF GENTAMICIN AND NEOMYCIN RESIDUES IN BOVINE KIDNEY. Susan B. Clark, Jeffrey A. Hurlbut and Carolyn A. Geisler.

SIMULTANEOUS DETERMINATION OF NITROFURAZONE, NITROFURANTOIN AND FURAZOLIDONE IN CATFISH (ICATALURUS PUNCTATUS) MUSCLE BY HPLC. Heidi S. Rupp, Robert K. Munns, Steven M. Plakas and Austin R. Long.

SIMULTANEOUS DETERMINATION XYLAZINE AND ITS MAJOR METABOLITE, 2,6-DIMETHYLANTHRAZINE, IN BOVINE AND SWINE KIDNEY BY HPLC. David C. Holland, Robert K. Munns, Jose E. Roybal, Jeffrey A. Hurlbut and Austin R. Long.

LUMINESCENCE OF AMINES CONDENSED ON FILTER PAPER. Catherine H. Hauste and Wanda S. Reiter.

WATER-QUALITY DATA REVIEW FOR INORGANIC CONSTITUENTS
AT THE NATIONAL WATER QUALITY LABORATORY, U.S.
GEOLOGICAL SURVEY. Mary E. Cast and Carmen G. Reed.

INTERNAL AUDITING RAISES QUALITY. Steven F. Baugh.

FRONTIERS IN QUANTITATIVE INFRARED ANALYSIS. Richard W.
Duerst, James E. Gagnon, Robert A. Pranis, William L. Stebbings, Gerald
J. Lilliquist, William E. Breneman, James W. Westberg, Colleen K. Spicer,
Richard E. Drugge, Sadanand V. Pathre, 3M Company, and Marilyn D.
Duerst, University of Wisconsin, River Falls, WI.

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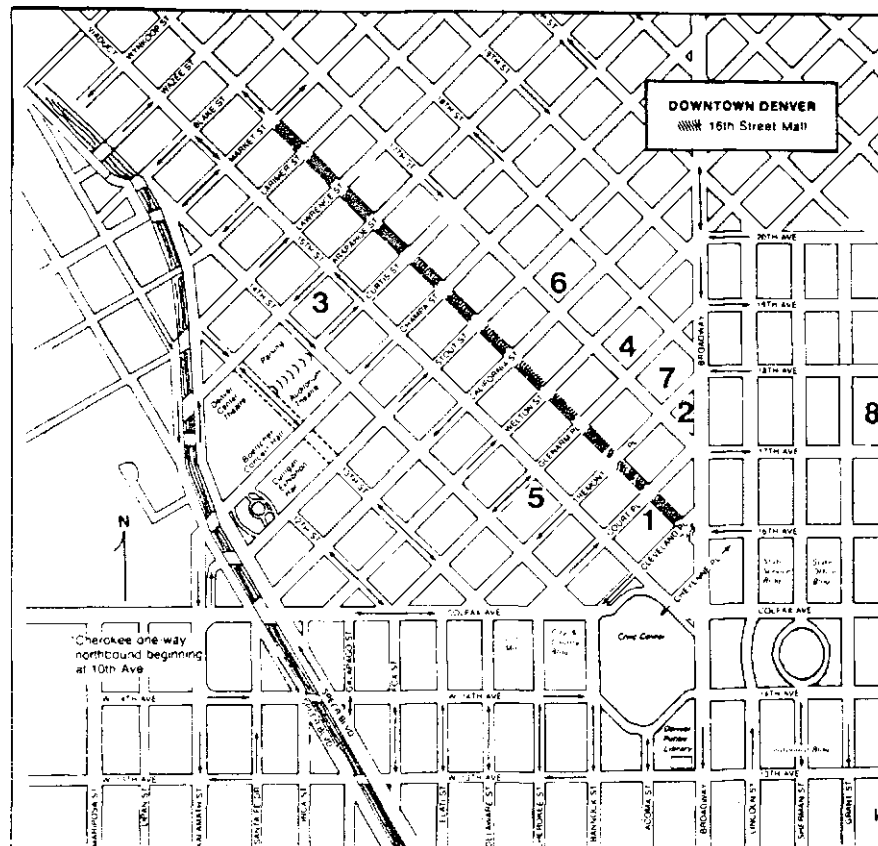
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