

THE

# TarHelium



A Publication of the North Carolina Section of the American Chemical Society

Volu. 20 No.4

March-April 1990

## 104th N.C. Sectional Conference



**Saturday April 7, 1990**  
**North Carolina Section**



**Paul M. Gross**  
**Chemical Laboratory**  
**Duke University**  
**Durham, NC**

### **CURRENT TOPICS IN POLYMER SCIENCE**

Sponsored by the North Carolina Local Section of the ACS

**When: Wednesday, May 2, 1990**  
**8:00am-4:30pm**

(see inside for further details)

**Where: Camille Dreyfuss Auditorium,**  
**Research Triangle Institute, RTP, NC**

In Chapel Hill, Call becky Smith, 962-2712; in Durham, Carolyn Bean, 684-2414;  
in Raleigh, Joyce Dunn, 737-2545; in Fayetteville, Sandra Smith, 486-1669.

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## NOTES FROM THE EDITOR

Our next deadline will be **August 15, 1990**. But...you will be hearing from us this summer. We are determined to get more advertisers into the TarHelium and the first step is to complete our membership survey. This will be sent out sometime during the summer asking our members to profile their interests and expertise and there will be some space for your always welcome suggestions!!!

Please pay special attention to the remaining events on our scientific calendar (cf. page 3 ) and also a note about the membership drive...I have just finished the interviewing process for a new chemist to work in my lab...The first question I asked (after the preliminaries, of course) was "Do you belong to the American Chemical Society?" In the age range that I interviewed (22 to 27) and not one candidate answered yes...Let's get practical (and serious!) about this recruiting thing! Let me know if you have any other ways to garner more chemists into the Society...

Also, I have several copies of the NPT show "America At Risk" which highlights the chemistry as well as the politics of the consumer movement from its inception to the present. If anyone is interested in borrowing it for class, please contact me.

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### ACS MEMBERSHIP DRIVE

The 1990 membership drive is now underway. Current members should have received a mailing with a membership application enclosed. If you enroll a new member by **April 30**, you receive a free ACS note pad holder. Please be sure to mark North Carolina under the section membership. If you have prospects for new members and want additional forms, contact any of the membership committee listed below.

Dr. Larry H. Bowen, NCSU (Chr.) 737-2939  
Dr. George Brine, RTI  
Dr. Michael Crimmins, UNC-CH  
Dr. Robert Higgins, Fayetteville State Univ.  
Dr. Robert Izydore, NCSU  
Dr. Larry Knecht, NC School of Sci. and Math  
Dr. Reginald Shiflett, Meredith Col.  
Dr. Harold Teague, Pembroke St. Univ.  
Dr. Steven Baldwin, Duke Univ.

**Executive Committee  
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American Chemical Society  
1990**

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Ex Officio (Chrom. SG)	Dr. J. Hudson	549-2501
Ex Officio (Mass Spec SG)	Dr. K. Tomer	541-2965
	Dr. R. vanBreeman	737-2942

**Committee Chairmen  
North Carolina Section  
American Chemical Society  
1990**

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Safety	Dr. George Wahl	737-2941
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Section Symposium	Dr. Mike Whangbo	737-3464
	Dr. Jeff Whittaker	850-7872

## Reminders for Remaining Meetings

April 7 NC Sectional Meeting Duke University

April 17 Dr. Charles K. Chiklis, formerly of Polaroid. "Synthesis, Properties and Applications of Processable Intrinsically Conducting Composites Based on Polypyrrole. Joint with SPE Local Section.

May 2 Current Topics in Polymer Science (for more information, cf. pag 4 )

May 10 Dr. Albert Highe, Raychem Corporation. "Phase Equilibrium in Poly(dimethylsiloxane) Gel Systems

The April 17 and May 10 meetings are at the NCSU Faculty Club. Call Dr. Keith Dawes or Dr. Maury Balik for further information.

### June 7 - 9, 1990

BUSA II - Boron USA Workshop addressing all aspects of fundamental and applied boron science. To be held at the Sheraton Imperial Hotel and Towers in Research Triangle Park, NC, USA (Bernard Spielvogel, Chairman)  
**Symposium and Poster Session**

#### Contact for the meeting:

Dr. Bernard F. Spielvogel  
Boron Biologicals, Inc.  
2811 O'Berry St.  
Raleigh, NC 27607  
Telephone: 919-832-2044

## CALL FOR NOMINATIONS THE 1990 NORTH CAROLINA DISTINGUISHED SPEAKER AWARD

Members of the NCACS are invited to submit nominations for the above award. The nominee need not be currently from our local section, but would be recognized for significant prior contributions to Chemistry in North Carolina. This year the Distinguished Speaker will present a lecture at our December monthly section meeting.

As a reminder, our past recipients have included: E.L. Eliel, E.M. Porter, G.H. Hitchings, P. Cuatrecasas.

A short supporting statement should be included with the nomination and/or biographical information for any candidate and sent to Dr. J. Chao by **May 1**. Final selection will be made by the Executive Committee of the NCACS. Please send nominations to :

Dr. Jim Chao, IBM Corp., P.O. Box 12195, Dept. E62/061, RTP, NC 27709.

**SHORT COURSE ANNOUNCEMENT**  
**CURRENT TOPICS IN POLYMER SCIENCE**

Sponsored by the North Carolina Local Section of the American Chemical Society

- When:** Wednesday, May 2, 1990, 8:00 am - 4:40 pm ( see attached schedule)  
**Where:** Camille Dreyfuss Auditorium, Research Triangle Institute, RTP, NC  
**Directions:** Take I-40 to the Cornwallis Road exit; proceed south on Cornwallis Road. Enter the RTI complex via East Institute Drive, which is the second paved road from the I-40 exit on the right. The sign for the Camille Dreyfuss lab is on the right; parking is available next to the sign.

This one-day course is intended to provide a fundamental basis for understanding polymer properties and how to characterize them, as well as specific details concerning two selected Classes of polymers of current research interest. It will be geared toward the chemist who would like to expand his/her understanding of polymer chemistry and behavior. The course will consist of four 1-1/2 hour lectures on the following topics:

**Introduction to Polymers:** *Dr. C. Maurice Balik, N.C. State University.* As Polymeric materials continue to replace metals in a variety of applications, it becomes more important to understand the basic and properties of this class of materials. This lecture will provide an introduction to polymer science, including polymer chain topology, aspects of polymer molecular weight distributions, polymer synthesis, solid-state morphology, structure property relationships, and commercial utilization of polymers. Some simple demonstrations will be given to illustrate selected polymer properties.

**Physical Methods of Characterizing Polymers:** *Dr. Sam Hudson, N.C. State University.* An outline of physical methods to characterize polymers will be presented. The first half of the material will cover methods that describe molecular properties to the polymer chain itself, including molecular weight methods for determining chain length, and IR and NMR spectroscopy for determining the primary chemical structure of the polymer chain. The second half of the lecture will cover methods relating to the morphology and bulk properties of polymers. Included in this group are thermal methods (DSC and DMA), wide- and small-angle x-ray scattering, and rheological methods. Time permitting, some typical data will also be presented.

**Thermoplastic Elastomers:** *Dr. Donald M. Priess, N.C. State University.* Thermoplastic elastomers (TPEs) are a relatively new class of injection-moldable polymers that are replacing conventional rubbers and some plastics in many applications. Building blocks, polymer structures, and polymerization process for the nine commercially available TPE families will be presented. Basic plastic and rubber technologies will be reviewed to illustrate the advantages of using TPEs to replace vulcanized rubbers.

**Liquid Crystalline Polymers:** *Dr. Edward T. Samulski, UNC-Chapel Hill.* The potential of intrinsically ordered, fluid phases of polymers, liquid crystalline polymers (LCPs), continues to provoke considerable interest among polymer scientists. My lecture is an overview of LCPs. It will emphasize the basic features of this unusual phase and indicate how these features are manifested in the physical properties of solids fabricated from LCPs. The perspective I will rely on and the prospects that I envision for these unusual polymers will be drawn from the recently completed study of LCPs commissioned by the National Materials Advisory Board of the NAS.

# CURRENT TOPICS IN POLYMER SCIENCE

Camille Dreyfuss Auditorium Research Triangle Institute

May 2, 1990

## Schedule

8:00-8:20 am	Coffee and late registration
8:20-8:30 am	Welcome ( <i>C.M. Balik, NCSU</i> )
8:30-10:00 am	Introduction to Polymers ( <i>C.M. Balik, NCSU</i> )
10:00-10:15 am	Break
10:15-11:45 am	Physical Characterization of Polymers ( <i>S. Hudson, NCSU</i> )
11:45-1:00 pm	Lunch at Research Triangle Institute
1:00-2:30 pm	Thermoplastic Elastomers ( <i>D.M. Preiss, NCSU</i> )
2:30-2:45 pm	Break
2:45-4:15 pm	Liquid Crystalline Polymers ( <i>E.T. Samulski, UNC-CH</i> )
4:15-4:30 pm	Discussion and closing remarks

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## REGISTRATION FORM

(Detach and return before April 27, 1990)

Check one

Cost: (includes lunch and refreshments) \$75.00 for non-ACS members   
\$50.00 for ACS members   
\$25.00 for students   
No fee for unemployed or retired

Name: \_\_\_\_\_ Business Phone: \_\_\_\_\_

Business Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Mail completed form and check to: Dr. C. Maurice Balik  
(Your cancelled check is your receipt.) Dept. of Materials Science and Engineering  
Box 7907  
North Carolina State University  
Raleigh, NC 27695-7907  
Phone: 919-737-2126, -2377

## North Carolina ACS Scholarship Award

The NCACS announces its SCHOLARSHIP AWARDS for 1990. Up to three awards of \$600 each will be made. Normally, two will be awarded to graduate student from doctorate-granting institutions and one to a student from an institution offering the master's degree or significant opportunities in research to undergraduate students. These awards will recognize achievement and potential in chemistry research and should be used to help the student further that potential. Award criteria include research accomplishments, excellence of academic record and quality of the application.

Eligibility requires enrollment at a college or university within the NC section territory and research in a department of chemistry, biochemistry, chemical engineering, or in a related department carrying out research under the direction of an ACS member.

Typed applications should be submitted in triplicate with the following:

- Full name, address and daytime phone number
- Up to 1000 word summary describing research, accomplishments, or progress
- A letter of recommendation from the Student's research director
- A copy of the appropriate transcripts
- A description of how the award will be used

The allowed uses (in consultation with the advisor) include travel to an ACS meeting, tuition for an ACS short course, purchase of technical books or research support. This award cannot be used to support research already funded by other sources.

The deadline for submitting applications is March 23, 1990.

Send applications to :

NCACS Scholarship Award Committee  
Dr. Erwin A. Vogler, (Chr.)  
Becton Dickinson Research Center  
P.O. Box 12016  
RTP, NC 27709

Award Recipients will be announced at the Section's 104th Conf. on April 7, 1990.



# 104th N.C. Sectional Conference

## Registration

8:30- Noon

Lobby of Gross Laboratory

## Papers

9:00- Noon

## Poster Session and Coffee Break

10:00- 10:40

Lobby of Gross Laboratory

## Awards Presentation

12:00 Noon

107 Gross Laboratory

Presentation of Fifty Year Certificates

High School Teacher Award

Centennial Scholarship Award

Recognition of Former Section Chairman

Recognition of NC Sectional Conference Sponsors

## Luncheon

12:20 P.M.

BBQ in Library Patio of Gross Laboratory

Luncheon will be a buffet. The meal is free to presenting speakers and session leaders; \$8.00 for members and attendees; \$4.00 for students. Reservations can be made by contacting one of the following by Tuesday, April 3...

In Chapel Hill, call Becky Smith, 962-2172; in Durham, Carolyn Bean, 684-2414; in Raleigh, Joyce Dunn 737-2545; in Fayetteville, Sandra Smith, 486-1669.

## Financial Assistance Includes the Generosity of:

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## Appreciation for their efforts:

Dr. James L. Chao, Program Chairman

Dr. Michael Prisant, ACS/Duke Facility Organizer

Dr. Weitao Yang, ACS/Duke Facility Organizer

Phi Lambda Upsilon of Duke University, Projectionists and Hosts

# PROGRAM

- 1. ORGANIC I -** Room 103 Dr. Paul J. Kropp, Presiding
- 9:00 "Novel Approaches to the Synthesis of Furanones", William R. Kwochka and Russell J. Linderman, North Carolina State University
- 9:20 "Solution Structures and Thermodynamics of Potential Intramolecularly-Chelated Lithium Compounds", Michael A. Nichols and Edward M. Arnett, Duke University
- 9:40 "Are Chelates Truly Intermediates in the Operation of Cram's Chelate Rule?", Xiangning Chen, Stephen V. Frye, and Ernest L. Eliel, University of North Carolina-Chapel Hill
- 10:00 *Coffee Break and Poster Session*
- 10:40 "Oxygen-17 NMR Studies of Sulfones Utilizing Lanthanide Shift Reagents", T.A. Powers and S.A. Evans, University of North Carolina- Chapel Hill
- 11:00 "A Synthetic Approach to Bacto Bolin", Robert E. McDevitt and Bert Fraser-Reid, Duke University
- 11:20 "Carbocycles from Carbohydrates: Studies Toward the Synthesis of Retigeramic Acid A", Yuji Shinozaki, Bert Fraser-Reid, and John Dickson, Duke University
- 2. ORGANIC II -** Room 104 Dr. Suzanne Purrington, Presiding
- 9:00 "Synthesis of Indolizidine Alkaloids 167B and 209D", Stephen E. Belmont and Richard P. Polniaszek, Duke University
- 9:20 "Use of 17O NMR Spectroscopy in a Stereochemical Study of the Alkaline Hydrolysis of Cyclic Six-Membered 2-Aryl Phosphates", Barbara Gordillo and Ernest Eliel, University of North Carolina- Chapel Hill
- 9:40 "Diastereoselective Addition of Organometallic Reagents to Chiral Iminium Ions", L.W. Dillard and R.P. Polniaszek, Duke University
- 10:00 *Coffee Break and Poster Session*
- 10:40 "Boron Trichloride Mediated Fluorinations", D.L. Woodard and S.T. Purrington, North Carolina State University
- 11:00 "Benzylic Carbanions Revisited: Reactivity and Stereoselectivity in 2- & 4-Phenyl-1,3,dioxanyl Anions", Mary Therese Neumann and Ernest L. Eliel, University of North Carolina- Chapel Hill

11:20 "Stereocontrolled Nucleophilic Additions to Acyclic Oxonium Ions", T.V. Anglekar and Russell J. Lindermann, North Carolina State University

**3. PHYSICAL I - Room 105 Dr. Charles G. Moreland, Presiding**

9:00 "1,2 Difluoroethane: A Vibrational Study of Solvent Friction", Frances C. Monroe and Richard A. MacPhail, Duke University

9:20 "Effects of Solvent Friction on the Torsional Dynamics of n-Butane Investigated Through Raman Spectroscopy", D.A. Cates and R.A. MacPhail, Duke University

9:40 "An Examination of the Functional Counterpoise Method in the Calculation of NMR Chemical Shift", Cu G. Phung and D.B. Chesnut, Duke University

10:00 *Coffee Break and Poster Session*

10:40 "Effects of Bond Length Modification on the NMR Chemical Shift", D.W. Weight and D.B. Chesnut, Duke University

11:00 "Extended Locally Dense Systems in Chemical Shift Calculations", Kevin D. Moore and D.B. Chesnut, Duke University

**4. PHYSICAL & POLYMER II - Room 107 Dr. Robert Shaw, Presiding**

9:00 "Slow Rotational Motions of Antibodies and Lipids Associated with Supported Phospholipid Monolayers Measured by Polarized Fluorescence Photobleaching Recovery", Melanie M. Timbs and Nancy L. Thompson, University of North Carolina-Chapel Hill

9:20 "Gas Phase Interaction Parameters for Binary Systems from Liquid-Vapor Equilibrium Measurements", Forrest W. Getzen, North Carolina State University

9:40 "Application of Step-Scan FTIR to Polymer Molecular Dynamics", C.J. Manning, R.A. Palmer, and J.L. Chao, Duke University

10:00 *Coffee Break and Poster Session*

10:40 "Polyphosphazenes for Microlithographic Applications", G.L. Grune, J. Harada, and V.T. Stannett, North Carolina State University

11:00 "Determination of the Diffusivity and Solubility of SO<sub>2</sub> in Alkyd Paint Films", W.H. Simendinger and C.M. Balik, North Carolina State University

11:20 "Determination of Tilt Bias Angles in Nematic Liquid Crystals", V. Fainzilberg, W. Hatfield, N. Spaulding, W. Estes, University of North Carolina- Chapel Hill

**5. INORGANIC - Room 205A Dr. Bernard Spielvogel, Presiding**

9:00 "Preparation of GaAs from Reaction of GaCl<sub>3</sub> with (Me<sub>3</sub>Si)<sub>3</sub>As in a 2:1 Mole Ratio, J.D. Johansen, R.B. Hallock, C.G. Pitt, A.T. McPhail, and R.L. Wells, Duke University

9:20 "Synthesis and Crystal Structures of (Me<sub>3</sub>SiCH<sub>2</sub>)<sub>2</sub>GaAs(SiMe<sub>3</sub>)<sub>2</sub>Ga(CH<sub>2</sub>SiMe<sub>3</sub>)<sub>2</sub>Cl and [(Me<sub>3</sub>SiCH<sub>2</sub>)<sub>2</sub>GaAs(SiMe<sub>3</sub>)<sub>2</sub>]<sub>2</sub>", A. Alvanipour, J. Pasterczyk, J.D. Johansen, C.G. Pitt, A.T. McPhail, and R.L. Wells, Duke University

9:40 "Synthesis, Characterization, and Reaction of (Me<sub>3</sub>Si)<sub>2</sub>AsCH<sub>2</sub>RCH<sub>2</sub>As(SiMe<sub>3</sub>)<sub>2</sub>, R=CH<sub>2</sub> and SiMe<sub>2</sub>", J. Pasterczyk, W.K. Holley, C.G. Pitt, and R.L. Wells, Duke University

10:00 *Coffee Break and Poster Session*

10:40 "Effects of Alternation in Some Quasi-One-Dimensional Transition Metal Complexes", Martin L. Kirk and William Hatfield, University of North Carolina- Chapel Hill

11:00 "Novel Exchange Coupling in Bis(phthalocyaninato)-lanthanum Sandwich Compounds", Kathleen L. Trojan, William E. Hatfield, Martin L. Kirk, and Keith D. Kepler, University of North Carolina- Chapel Hill

11:20 "The Kinetics of Iron(III) Ligand Exchange Reactions Involving Hydroxamic Acids in the Presence of Surfactants", Pek Lee Choo, Suzanne W. Harman, A.L. Crumbliss, Duke University

11:40 "Electronic Properties of Mixed-Valence Metal, K<sub>3</sub>Cu<sub>8</sub>S<sub>6</sub>", Hye Kyeong Ro and W.E. Hatfield, University of North Carolina- Chapel Hill

**6. ANALYTICAL I - Room 110 Dr. William Switzer**

9:00 "Investigation of the Quantitative Capabilities of GC/MI-IR Spectrometry", J.W. Childers(1), N.K. Wilson(2), and R.K. Barbour(2), NSI-Environmental Sciences(1) and US-EPA(2)

9:20 "A Fluorometric Solution Assay for Bovine Carbonic Anhydrase and its Applicability to the Study of Sorption-Induced Conformational Perturbations of the Adsorbed Enzyme", Kevin Bradley, and Charles H. Lochmuller, Duke University

9:40 "A Cylindrical Thin-Layer Cell for UV-VIS Spectroelectrochemistry", Paul A. Flowers, Pembroke State University

10:00 *Coffee Break and Poster Session*

10:40 "Step-Scan FTIR-PAS Depth Profiling", R.M. Dittmar, R.A. Palmer, and J.L. Chao, Duke University

11:00 "Characterization of Antibody Binding to Antibody Receptors in Model Cell Membranes with Total Internal Reflection Fluorescence Microscopy", Claudia Poglitsch, Martina Sumner, and Nancy Thompson, University of North Carolina- Chapel Hill

11:20 "Binding of a Monoclonal Antibody and its Fab Fragment to Supported Phospholipid Monolayers Measured by Total Internal Reflection Fluorescence Microscopy", Mary Lee Pisarchick and Nancy L. Thompson, University of North Carolina- Chapel Hill

11:40 "The Quantitation and Isolation of Todoromatic Acid and Jurabione in Fraser Firs", Felipe Sanchez and Louis Jones, North Carolina State University

**7. ANALYTICAL II - Room 111 Dr. Maurice Bursey, Presiding**

9:00 "In-Situ FTIR Investigation of the Lithium Electrode Surface", J.M. Widder, C.J. Manning, R.A. Palmer, and J.L. Chao, Duke University and IBM Corporation

9:20 "Association of Lanthanide Cations with Bile Salt Aggregates", Steven M. Meyerhoffer, Linda B. McGown, and Thomas J. Wenzel, Duke University

9:40 "Effect of Water on an Ar-ICP", Su-Jane Den and John W. Olesik, University of North Carolina- Chapel Hill

10:00 *Coffee Break and Poster Session*

10:40 "Radially-Resolved Studies of EIE and non-EIE Matrix Effects in ICP-AES", Eric Williamsen and John Olesik, University of North Carolina- Chapel Hill

11:00 "Secondary Ion Mass Spectrometry of Langmuir-Boldgett Films", V.F. Guarisco, R.W. Linton, and J.J. Lee, University of North Carolina- Chapel Hill

11:20 "Depth Profiling with Angle Dependent X-Ray Photoelectron Spectroscopy (ADXPS)", K.A. Hooker, E. Danielson, R.W. Linton, and J.E. Fulghum, University of North Carolina- Chapel Hill

**8. BIOCHEMICAL - Room 228 Dr. Jeff Whittaker, Presiding**

9:00 "Binding of Monospecific  $\alpha$ H2B Antibody to Mononucleosomes", Orapin P. Rubino, C. Brent Oswald, and Barbara Ramsay Shaw, Duke University

- 9:20 "Effect of pH on Cytosine Deamination", Ubonwon A. Stewart, Theodore Gonzalez, and Barbara Ramsay Shaw, Duke University
- 9:40 "Xanthine Biosensor Based on Xanthine Oxidase Adsorbed to Colloidal Gold", J.G. Stonehuerner, J. Zhao, R.W. Henkens, and A.L. Crumbliss, Duke University

10:00 *Coffee Break and Poster Session*

- 10:40 "Use of Glycerol as an Alternate Hydrogen Acceptor By *Lactobacillus reuteri*", Todd L. Talarico and Walter J. Drobrogosz, North Carolina State University

**9. Chemical Education - Room 228 Dr. Jeff Whittaker, Presiding**

- 11:00 "Chemistry for Non-Scientists at NCSU", George H. Wahl, Jr., North Carolina State University
- 11:20 "Nail in the Pail: When is  $\Delta S = Q / T$ ?", John E. Reissner, Pembroke State University

**10. POSTER SESSION - 10:00 - 10:40 Lobby- Gross Lab**

"Oligosaccharide Assignment and Sequencing: 1H and 13C Analyses of D-amygdalin", Anthony Ribeiro, Duke University

"Comparative Study of Gas Corrosion Products on Connector Contacts", R.C. Michael Lonon, R.A. Palmer, and J.L. Chao, Duke University and IBM Corporation

"Inhibition of Proteolytic Cleavage of Bovine Prothrombin Fragment I Derivatives in the Presence of Ca(II) or Mg(II)-Studies Using Chymotrypsin and V8 Proteinase", M.G. Panek and R.G. Hiskey, University of North Carolina-Chapel Hill

"Urinary Metabolites of 1,2,3-13C acrylamide Determined by 13C Nuclear Magnetic Resonance Spectroscopy", S.C.J. Sumner, J.P. MacNeela, and T.R. Fennell, Chemical Industry Institute of Toxicology

"Porosity Test Selection for Gold and Palladium Contact Systems", Sarah E. Gay and Randy R. Gore, IBM Corporation

"Detection of Urinary Metabolites of 1,2,3-13C acrylonitrile in the Rat and Mouse Using 13C Nuclear Magnetic Resonance Spectroscopy", T.R. Fennell, S.C.J. Sumner, S.D. Held, and G.L. Kedderis, Chemical Industry Institute of Toxicology.

"PC Analysis of Polymers with an On-Line Viscometer Detector", Howard James, Peter Talarico, Juris Ekmanis, and William A. Dark, Waters Chromatography Division of Millipore Corporation.

*The Tarhelium is a publication of the North Carolina Section of the American Chemical Society. The views expressed herein are not necessarily those of the Section.*

B.A. Whittaker, Ph.D., *Editor*  
Linda Stroud, *Advertising Manager*  
W. Switzer, Ph.D., *Mtg. Announcement Editor*

*Please direct all correspondence and submissions to the attention of the editor:*

**B.A. Whittaker, Ph. D.**

3108 Anderson Drive  
Raleigh, NC 27609

**Executive Committee:**

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**Next deadline for the Tarhelium will be August 15, 1990.** Contributions should be on PC disk in WordPerfect, DW-4, RFT, DCA, Wordstar, XYWrite, Microsoft Word or ASCII format or on Macintosh disk in any format.

If you change your membership status or your *Tarhelium* mailing address, please submit your new address along with your old address in the form of a recent C&EN or *Tarhelium* address label to:  
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