

Electro-optic polymers

# Highly ordered fibres and films

An international conference organized and sponsored by the journal **polymer** 

# 8–10 August 1990 The Johns Hopkins University, Baltimore, Maryland, USA

— Conference Chairmen —

Prof. R. K. Eby (The Johns Hopkins University, USA) Dr D. W. McCall (AT & T Bell Labs, Murray Hill, USA) Dr L. Smith (NIST, Gaithersburg, USA) Dr R. M. Ikeda (E.I. du Pont, Wilmington, USA) Dr J. M. Pochan (Eastman Kodak, Rochester, USA) Prof. R. S. Porter (University of Massachusetts, USA) Prof. P. Smith (University of California, Santa Barbara, USA) Prof. D. R. Ulrich (Air Force Office of Scientific Research, USA)

**Speciality Polymers** has established itself as a leading polymer science and technology conference series. This year's gathering of international colleagues will focus on electro-optic polymers and highly ordered fibres and films. The invited speakers will address the latest developments worldwide in these two exciting areas of polymer research. The contributed programme of oral and poster presentations has been put together to give delegates the opportunity to discuss established and new ideas.

### Registration

Full three-day registration £290 \$465 Student registration £95 \$155

The three-day registration fee includes admission to the scientific sessions, the abstract book, morning and afternoon refreshments, the Welcome Reception, the Conference Banquet and the special conference issue of POLYMER. (For student delegates, the registration fee does **not** include the Conference Banquet or the special conference issue of POLYMER.)

Full details of registration and a Delegate Registration Form are included in the second circular, available from the Conference Office.

### Accommodation

A limited number of rooms has been reserved on The Johns Hopkins University campus. Delegates wishing to stay on campus should fill in the necessary details on the registration form and return the form with payment **as soon as possible**.

For those delegates requiring hotel accommodation, a number of rooms has been reserved at the Lord Baltimore Radisson Plaza, 20 West Baltimore Street, Baltimore, Maryland 21201, USA (Tel: 301 539 8400).

Delegates requiring hotel accommodation should complete the hotel booking form and return it **directly to the hotel**, indicating that they are attending **SPECIALITY POLYMERS** '90.

Details of the cost of accommodation and meals on campus and a booking form and also a hotel booking form are included in the second circular, available from the Conference Office.

Copies of the **SP '90** second circular with full details of registration and accommodation are available from the Conference Office. Please contact the Office **as soon as possible** if you wish to attend the conference. Assistant Conference Organizer: **Teresa MacLeod**, Conference Manager: **Caroline Sumner** 

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## Wednesday 8 August 1990

#### 9.00-10.25

Welcome — Dean Vandelinde (*The Johns Hopkins University, USA*) Introductory Comments — D. R. Ulrich (AFOSR, USA)

#### 9.40-10.25 Plenary session I

Ultrathin layers of non-amphiphilic polymers: molecular design, properties and applications G. Wegner (*Max-Planck-Institut, FRG*)

### 10.55-12.25 Parallel sessions

**Conducting polymers** Structure and morphology of polyphenylene vinylenes F. E. Karasz (*University of Massachusetts, USA*)

Oriented polyacetylene and polyacetylene-polynorbornene block copolymers: comparison of optical and electrical properties

F. Stelzer and G. Leising (*Technical University Graz, Austria*)

Monomer tailoring to control the redox potentials of conductive polyheterocycles

A. Berlin, G. Pagani, F. Sannicolò, G. Schiavon and G. Zotti (*University of Milan, Italy*)

The effect of solubilizing alkyl side groups on the mechanical and electrical properties of poly(3-alkylthio-phenes)

J. Moulton (University of California, Santa Barbara, USA)

#### Mechanical properties of oriented fibers

Mechanical behavior of rigid rod polymer fibers I: measurement of axial compressive and transverse tensile strengths

F. J. McGarry and J. E. Moalli (*Massachusetts Institute of Technology, USA*)

Monitoring the compressive behaviour of single fibres under axial compression

N. Melanitis, C. Vlattas and C. Galiotis (*Queen Mary & Westfield College, UK*)

Characterization of compressive properties of high performance fibres

K. S. Macturk (The Johns Hopkins University, USA),

R. K. Eby (*The University of Akron, USA*) and W. W. Adams (*Wright Research and Development Center, USA*)

Mechanical properties of polyamides containing reactive diacetylene functionalities

H. W. Beckham and M. F. Rubner (*Massachusetts Institute of Technology, USA*)

#### 2.00–3.30 Parallel sessions

#### NLO polymers I

Third-order nonlinear optical processes in molecular and polymeric materials

P. N. Prasad (State University of New York, USA)

Low dimensional conjugated systems for nonlinear optics: polydiynes

H. Sasabe, Y. Wada, H. Ookawa and A. Yamada (*The Institute of Physical and Chemical Research, Japan*) and A. F. Garito (*University of Pennsylvania, USA*)

The design of new copolymers for  $\chi^{(3)}$  applications

C. W. Spangler, T. J. Hall and P.-K. Liu (Northern Illinois University, USA) and D. W. Polis, L. S. Sapochak and L. R. Dalton (University of Southern California, USA)

Liquid crystalline polymers as electrooptically active media

R. V. Talroze (M. V. Lomonosov Moscow State University, USSR)

#### Highly ordered polymers I

The morphology and ductility of polyethylene reactor powder

L. H. Wang, S. Ottani and R. S. Porter (University of Massachusetts, USA)

Oriented fibres and films based on flexible polymers

P. J. Lemstra (*Eindhoven University of Technology, The Netherlands*) and N. Gerrits (*DSM Research, The Netherlands*)

Supermolecular structure of high modulus/strength gel spun/hot drawn PE-fibres

D. Hofmann, D. Geiß and E. Schulz (*Academy of Sciences of the German Democratic Republic, GDR*) DSC and DMTA analysis of a thermotropic LCP

J. Sarlin and P. Törmälä (*Tampere University of Tech-nology, Finland*)

#### 4.00–5.20 Parallel sessions

Polydiacetylene conjugated systems

<sup>13</sup>C NMR studies of polydiacetylene

A. E. Tonelli (*AT & T Bell Laboratories, USA*) Structural changes in polydiacetylene single crystals and monomolecular films induced by oxygen adsorption B. J. E. Smith and D. N. Batchelder (*Queen Mary & Westfield College, UK*)

Optical nonlinearity in transition metal poly-ynes P. L. Porter, S. Guha, K. Kang and C. C. Frazier (*Martin Marietta Laboratories, USA*)

Electronic tuning of polydiacetylene backbone: a comparative study

K. N. Babu and S. S. Talwar (Indian Institute of Technology Powai, India)

#### Highly ordered polymers I

Molecular strain in high-modulus polyethylene fibers during stress relaxation studied by Raman microscopy B. J. Kip, P. J. R. Leblans and R. J. Meier (*DSM Research, The Netherlands*) and M. C. P. Van Eijk (*Eindhoven* 

University of Technology, The Netherlands) Structure and morphology of highly oriented, radiation crosslinked polyethylene fibres

P. G. Klein, J. A. G. Orozco and I. M. Ward (Leeds University, UK)

Development of order and orientation in acrylic fibres S. B. Smith and S. J. Law (*Courtaulds Research, UK*)

Structure of oriented high-modulus PE

S. N. Chvalun, Yu. A. Zubov and N. F. Bakeev (Karpov Institute of Physical Chemistry, USSR)

### Thursday 9 August 1990

9.00–10.00 Plenary session II

Ultimate properties of rigid-rod polymer fibers W. W. Adams and D. S. Dudis (*Wright Research & Development Center, USA*) and S. G. Wierschke (*USAF Academy, USA*) and J. R. Shoemaker (*AF Institute of Technology, USA*) and P. G. Lenhert (*Vanderbilt University, USA*) and R. K. Eby (*The Johns Hopkins University, USA*) and H. Jiang (*Georgia Institute of Technology, USA*)

Nonlinear optics and random glassy polymers A. F. Garito (University of Pennsylvania, USA)

### 10.30-12.40 Parallel sessions

NLO polymers II

Electro-optical properties of polymer/(liquid crystal) composite systems

T. Kajiyama (Kyushu University, Japan)

Poly(arylene vinylene) polymers for optical device applications

D. D. C. Bradley (*Cavendish Laboratory, UK*) Rigid-rod derived amorphous polydiacetylenes M. A. Schen (*NIST, USA*)

Second harmonic generation of derivatives and analogs of benzophenone and chalcone

M. P. Cockerham, E. A. Chauchard, S. Guha and C. C. Frazier (*Martin Marietta Laboratories, USA*)

Synthesis and characterization of nonlinear optical active materials

L. Yu, M. Chen and L. R. Dalton (*University of Southern California, USA*)

#### Highly ordered polymers II

Oriented conjugated polymers: conducting and stiff high-performance materials

P. Smith (University of California at Santa Barbara, USA)

Structure-property relations and processing of rod-like aromatic polyamides

H. W. Schmidt (*University of California at Santa Barbara, USA*)

Evolution of order during the formation of biaxially drawn poly(ethylene terephthalate) film

D. R. Salem (TRI/Princeton, USA)

Viscoelastic relaxation in oriented semicrystalline polymers T. S. Chow and A. C. Vanlaeken (*Xerox Webster Research Center, USA*)

Crystallization of rigid polymers and their acid solvent studied by synchrotron radiation

Y. Cohen (*Technion, Israel*) and S. Buchner and H. G. Zachmann (*University of Hamburg, FRG*) and D. Davidov (*Hebrew University, Israel*) and W. W. Adams (*Wright Research & Development Center, USA*)

Aspects for synthesis, analysis and application of aromatic conjugated polycondensates

A. Greiner and W. Heitz (*Philipps-University Marburg*, FRG)

2.00-5.00 Poster session

### Friday 10 August 1990

#### 9.00-10.00 Plenary session III

Development of materials with enhanced optical nonlinearity by control of ultrastructure

L. R. Dalton (University of Southern California, USA)

High performance polyimide fibers

S. Cheng and F. W. Harris (University of Akron, USA)

#### 10.30-12.30 Parallel sessions

#### General session I

Mechanical behavior of rigid rod polymer fibers II: improvement of compressive strength

F. J. McGarry and J. E. Moalli (*Massachusetts Institute of Technology, USA*)

Micromechanical studies on Kevlar 49/epoxy model composites

C. Vlattas and C. Galiotis (*Queen Mary & Westfield College, UK*)

Thermal stability of polybenzobisazole rigid-rod polymers L. Denny (*Wright-Patterson AFB, USA*)

Base treatment of polyacrylonitrile for carbonization I. R. Herbert, Z. Bashir and D. C. Bott (*Courtaulds Research, UK*)

Compressive mechanical properties and retraction behaviour of thermotropic liquid crystalline copolyesters S. S. Kordestani and A. H. Windle (*University of Cambridge, UK*)

Arylidene polymers XI: synthesis, characterization and electrical conductivity of poly(2,5bis[*m*-nitrobenzylidene]-cyclopentanone) sulfide and theoretical studies, PPP, for its monomeric unit

M. A. Abd-Alla and A. S. El-Shahawy (*Assiut University, Egypt*)

#### General session II

Shear flow stability of liquid crystal polymers

J. J. Magda, S. G. Baek and K. L. Devries (*University of Utah, USA*) and R. G. Larson (*AT & T Bell Laboratories, USA*)

Formation and characterization of the fibers and films from mesophase solutions of cellulose in the ammonia/ ammonium thiocyanate solvent

K. S. Yang (*Chonnam National University, Korea*) and M. H. Theil, Y. S. Chen and J. A. Cuculo (*N. C. State University, USA*)

Electro-optic properties of polyelectrolyte solutions W. Oppermann (*Technical University Clausthal, FRG*) Internal electric field in a ferroelectric copolymer G. T. Davis and A. S. Dereggi (*NIST, USA*) and N. Tsutsumi (*Kyoto Institute of Technology, Japan*) Structure and dynamics of polyelectrolyte solutions

S. Förster, C. Schnee and M. Schmidt (*Max-Planck-Institut, FRG*)

#### 2.00–4.30 Plenary session IV

The natural sciences in our century H. Mark (*Polytechnic Institute of New York, USA*) Rigid rod polymer fibres and composites R. J. Young (*Manchester Materials Science Centre, UK*) Low-loss, high-bandwidth GI polymer optical fiber Y. Koike, E. Nihei and Y. Ohtsuka (*Keio University, Japan*) Polyimides for thin film packaging applications G. Czornyj (*IBM, USA*) Closing remarks — R. K. Eby (*The Johns Hopkins University, USA*)

This scientific programme was correct at the time of going to press. The organizers reserve the right to make any changes which may be necessary.