

# speciality polymers '88

High Performance Polymers · Extreme Environment Polymers · Electroactive Polymers

3rd International Conference on New Polymeric Materials

Organized and sponsored by the journal **polymer**

**13–15 September 1988**

**Queens' College, Cambridge University, UK**

Conference Chairmen:

**Professor Sir Geoffrey Allen, FRS** Unilever plc, UK **Professor I.M. Ward, FRS** University of Leeds, UK

International Coordinator: **Professor Roger Epton** Wolverhampton Polytechnic, UK

Local Coordinator: **Dr Alan Windle** University of Cambridge, UK

**SPECIALITY POLYMERS '88** is the third international conference in the 'Speciality Polymers' series, organized and sponsored by the journal **polymer**. This year, the scientific programme concentrates on the important polymer research areas of High Performance (Engineering) and Extreme Environment Polymers, and Electroactive Polymers. The conference will meet the need for an exchange of information on the latest research and technology. **SPECIALITY POLYMERS '88** provides a forum and a means for interests in speciality polymers to interface with traditional polymer expertise in synthesis/characterization, processing/applications and structure/property relationships.

The scientific programme includes presentations from many distinguished international scientists with contributions from both academia and industry. The conference is being held over three days, with plenary lectures, sessions of invited and contributed oral papers and an afternoon given to the poster papers.

**SPECIALITY POLYMERS '88** is being held in the beautiful old university town of Cambridge, famous for its colleges, museums and other attractions that make the city, which is also a market town, a favourite with visitors.

The venue for **SPECIALITY POLYMERS '88** will be Queens' College, Cambridge, one of the most beautiful colleges in Cambridge and situated close to the city centre.

## REGISTRATION

Delegates who register *before 29 July 1988* will benefit from a reduced registration fee of £195 + 15% VAT. The late registration fee at the full rate (*after 29 July 1988*) is £225 + 15% VAT. To take advantage of the reduced registration fee, the completed registration form *and* payment must be received by The Conference Organizer no later than 29 July 1988.

The registration fee covers admission to all scientific sessions, abstract book, morning and afternoon refreshments, social evening and conference banquet (except student and one-day delegates), and a copy of the special **polymer** issue of collected papers from the conference, which will be published after the meeting (except student and one-day delegates).

One-day registration fee £115 + 15% VAT. Student registration fee £70 + 15% VAT (registration form must be accompanied by a letter from teacher or supervisor indicating that registrant is a bona-fide full time student).

## ACCOMMODATION

### Queens' College

Rooms have been reserved in Fisher Building, Cripps Court and Erasmus Building for delegates requiring College accommodation.

A limited number of rooms in Queens' College can be booked for the nights after the conference on a bed and breakfast basis, up to the weekend 17/18 September 1988. Delegates wishing to take advantage of this facility should book early as possible as allocations will be subject to availability and will be made strictly as applications are received. Only those delegates resident in Queens' College during the conference can apply for rooms pre- and post-conference.

Details of the cost of accommodation and meals in Queens' College and a booking form can be obtained from the **SPECIALITY POLYMERS '88** conference office.

### Hotel Accommodation

A number of rooms have been reserved for delegates to **SPECIALITY POLYMERS '88** who would prefer hotel accommodation. The designated hotel is:

The Garden House Hotel, Granta Place, Mill Lane, Cambridge CB2 1RT, UK. Tel: (0223) 63421. Telex: 81463. Fax: (0223) 316605.

Copies of the second circular with full registration information and a Delegate Registration Form are available from the Conference Organizer. If you plan to attend **SPECIALITY POLYMERS '88** please contact the Conference Office for a registration form as soon as possible as it is anticipated that the number of people who wish to register may exceed the number who can be accommodated.

**Conference Organizer:** Monique Heald **Conference Secretary:** Caroline Sumner

**Speciality Polymers '88** Butterworth Scientific Ltd, PO Box 63, Westbury House, Bury Street, Guildford GU2 5BH, UK  
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# CONFERENCE PROGRAMME

## Tuesday 13 September 1988

9.00–9.20 Opening  
**Introductory Address** (Lady Mitchell Hall)  
 Professor Sir Sam Edwards FRS (*University of Cambridge, UK*)

9.30–10.50 **Plenary session**  
 Chairman: Professor I.M. Ward FRS (*University of Leeds, UK*)

Molecular and surface engineering of effect polymers  
 D.T. Clark (*ICI, Wilton, UK*)

Polymers for advanced applications and in an extreme environment  
 O. Vogl, J. Bartus and A. Sustic (*Polytechnic University, New York, USA*)

11.20–12.30 Parallel session 1 – High Performance  
 Chairman: Dr J.N. Hay (*University of Birmingham, UK*)

The non-linear elasticity of strong fibres  
 R.K. Eby (*The Johns Hopkins University, Baltimore, USA*)

Measurement of deformation of high modulus fibres and composites using Raman microscopy  
 R.J. Young, R.J. Day and M. Zakikhani (*UMIST, Manchester, UK*)

11.20–12.30 Parallel session 2 – Electroactive  
 Chairman: Professor T.J. Lewis (*University College of North Wales*)

Opto-electronics of polymer liquid crystals  
 H.J. Coles (*University of Manchester, UK*)

Control of alignment in liquid crystalline side chain polymers by the presence and absence of directing electric fields  
 G. Williams (*University College of Wales, Aberystwyth, UK*)

2.00–3.20 Parallel session 3 – High Performance (Flow)  
 Chairman: Dr A.H. Windle (*University of Cambridge, UK*)

Shear flow of main-chain liquid crystalline polymer solutions  
 B. Ernst and P. Navard (*Ecole Nationale Supérieure des Mines, Valbonne, France*)

Flow induced textures in multiphase polymers  
 F. Ehtaiatkar, M.J. Folkes and S.C. Steadman (*Brunel University, UK*)

Rheology of nematic polymers by n.m.r. techniques  
 A.F. Martins (*University of Lisbon, Portugal*)

2.00–3.20 Parallel session 4 – Electroactive (Conducting Polymers)  
 Chairman: Professor J.M.G. Cowie (*University of Stirling, UK*)

New solid polymer electrolytes: ionic conductivities for solid poly (*N, N*-disubstituted acrylamide)s complexed with lithium salts  
 S.A. Dobrowski, J.E. McIntyre, I.M. Ward and G.R. Davies (*University of Leeds, UK*)

Structure–property relationships in ionic interpolymer complexes  
 D.C. Bott, W.A.E. Dunk and G. Manns (*Courtaulds, Coventry, UK*)

Polymers and ionomers as electrolytes for solid-state batteries  
 J.-F. LeNest, A. Gandini and H. Cheradame (*EFPG, Saint Martin d'Hères, France*)

3.50–5.30 Parallel session 5 – High Performance/Extreme Environment

Chairman: Professor O. Vogl (*Polytechnic University, New York, USA*)

Segmented block copolymers with polyamides  
 R.J. Gaymans, E. Walch and P.F. van Hutten (*Twente University of Technology, The Netherlands*)

Structure–property behaviour of soluble polyimide–polydimethylsiloxane segmented copolymers

C.A. Arnold, J.D. Summers, Y.P. Chen, D.H. Chen, J.D. Graybeal and J.E. McGrath (*Virginia Polytechnic Institute and State University, USA*)

Polyethylene copolymer resins for distributing natural gas

Y.-L. Huang and N. Brown (*University of Pennsylvania, USA*)

Deformation behaviour of Kevlar® aramid fibres  
 S.R. Allen and E.J. Roche (*du Pont, Wilmington, USA*)

Properties of high modulus PE fibres and their composites at high deformation rates

D.C. Prevorsek, S. Kavesh and Y.D. Kwon (*Allied Signal Inc., Morristown, USA*)

3.50–5.30 Parallel session 6 – Electroactive (Conducting Polymers)

Chairman: Professor P. Smith (*University of California, Santa Barbara, USA*)

The synthesis and properties of some novel unsymmetrically substituted diacetylenes

G.H.W. Milburn, A. Werninck, J. Tsibouklis, E. Bolton, G. Thomson and A.J. Shand (*Napier College, Edinburgh, UK*)

Novel polydiacetylenes derived from liquid crystalline precursors

M.A. Schen (*National Bureau of Standards, Gaithersburg, USA*)

The synthesis and electro-optical properties of polyacetylene copolymers

R. Farren, A.J. Ammas, M.S. Beevers and J.A. Stowell (*Aston University, UK*)

The future of conductive poly[aniline(s)], poly[pyrrole(s)] and poly[thiophen(s)]

P. Kathirgamanathan (*Cookson Central Research, UK*)

Development of high-service-temperature conductive polymers

R.E. Cameron, T.S. Kuan, A. L. Landis, B.R. Mattes (*Lockheed Aeronautical Systems Co., CA, USA*)

7.30 DINNER (Queens' College)

8.45 WINE TASTING (Old Hall, Queens' College)

## Wednesday 14 September 1988

9.00–10.20 **Plenary session** (Lady Mitchell Hall)

Chairman: Professor Sir Geoffrey Allen FRS (*Unilever plc, UK*)

Some aspects of side-chain liquid crystal polymers, especially polysiloxanes, in relation to their potential for speciality applications

G.W. Gray, D. Lacey, G. Nestor and M.S. White (*University of Hull, UK*)

Electroactivity in polymer systems

T.J. Lewis (*University College of North Wales, UK*)

Speciality Polymers '88 Conference Programme

- 10.50–12.30 Parallel session 7 – High Performance  
Chairman: Professor R.K. Eby (*The Johns Hopkins University, Baltimore, USA*)  
High temperature polymer blends  
F.E. Karasz (*University of Massachusetts, Amherst, USA*)  
Phase separation in polymer alloys  
I. Sanchez (*Alcoa Laboratories, PA, USA*)  
PC – PBTP Blends – Relationship between chain microstructure, morphology and physical properties  
D. Delimoy, B. Goffaux, J. Devaux, C. Bailly, R. Legras and J.P. Mercier (*Université Catholique de Louvain, Belgium*)
- 10.50–12.30 Parallel session 8 – Electroactive  
Chairman: Professor C.H. Bamford FRS (*University of Liverpool, UK*)  
Novel electron beam resist materials – incorporation of plasma etch resistance into positive and negative resists  
S. Affrossman, M. Barshshae, K. Coffey, D. Hayward and R.A. Pethrick (*University of Strathclyde, Glasgow, UK*)  
Processing of electrically conductive polymers  
P. Smith (*University of California, Santa Barbara, USA*)  
Langmuir-Blodgett films from preformed polymers  
F. Davies, P. Hodge, R. Jones, E. Khoshdel, R.H. Tredgold and C.S. Winter (*University of Lancaster, UK*)  
The synthesis of polymers containing 'Si' and 'Sn' for potential use as photoresists  
J.E. Loftus and B. Gordon III (*Penn State University, PA, USA*)
- 2.30–5.00 **POSTER SESSION & TEA** (University Centre)  
7.30 SHERRY RECEPTION (Queens' College)  
8.00 CONFERENCE BANQUET (Queens' College)
- Thursday 15 September 1988**
- 9.00–10.20 **Plenary session** (Lady Mitchell Hall)  
Chairman: Professor R. Epton (*Wolverhampton Polytechnic, UK*)  
Solid polyelectrolytes – A new class of materials  
L. Dominguez, W. Meyer, H.U. Simmrock and G. Wegner (*Max Planck Institute, Mainz, FRG*)  
From functional polymers to zerovalent metal polymer composites  
A. Warshawsky (*Weizmann Institute, Rehovot, Israel*)
- 10.50–12.30 Parallel session 9 – High Performance  
Chairman: Professor D.C. Bassett (*University of Reading, UK*)  
X-ray and electron diffraction studies on rigid and semi-rigid liquid crystal polymers  
E.D.T. Atkins, S.D. Hudson, E.L. Thomas and R.W. Lenz (*University of Bristol, UK, and University of Massachusetts, Amherst, USA*)  
Three-dimensional structure of wholly aromatic thermotropic copolyesters  
J. Blackwell and A. Biswas (*Case Western Reserve University, USA*)  
Structural investigations on rod-like polymers  
M. Ballauff (*Max Planck Institute, Mainz, FRG*)
- Liquid crystalline oligomers  
W.-C. Chan, J.A. Mooney and A.H. Windle (*Cambridge University, UK*)
- 10.50–12.30 Parallel session 10 – Electroactive (Optics)  
Chairman: Professor B.R. Jennings (*University of Reading, UK*)  
Photochromic liquid crystal polymers  
I. Cabrera, S. Yitzchaik and V. Krongauz (*The Weizmann Institute of Science, Rehovot, Israel*)  
A planar polymeric photodetector for integrated optics  
R. Reuter and H. Franke (*University of Osnabruck, FRG*)  
Study of the dynamics of second harmonic generation in doped and aligned poly(methyl methacrylate)  
P. Le Barny, S. Esselin, J. Raffy, J.P. Pocholle and D. Broussoux (*Thomson-CSF, Orsay, France*)  
Linear, nonlinear and Raman spectroscopy of polydiacetylenes  
D.J. Sandman and Y.J. Chen (*GTE Laboratories Inc., Waltham, USA*)
- 2.00–4.00 Parallel session 11 – High Performance  
Chairman: Professor W.J. Feast (*University of Durham, UK*)  
A nuclear magnetic resonance study of poly (aryl-ether-ether-ketone), PEEK and polyphenylene sulphide, PPS in the solid state  
N.R. Jagannathan, J.N. Clark and F.G. Herring (*University of British Columbia, Canada*)  
Formation and properties of high  $T_g$  thermosetting polymers  
J.K. Gillham (*Princeton University, USA*)  
Crosslinking reactions of PMR-15 polyimide  
J.D. Boyle, J.N. Hay, S.F. Parker and D. Wilson (*BP Research Centre, Sunbury, UK*)  
Materials for high density electronic packaging and interconnection  
D.W. McCall (*AT & T Bell Laboratories, Murray Hill, USA*)
- 2.00–4.00 Parallel session 12 – Electroactive  
Chairman: Professor G. Wegner (*Max Planck Institute, Mainz, FRG*)  
Molecular optical devices  
R.S. Potember, R.C. Hoffman, R.A. Murphy and K.A. Stetyick (*The Johns Hopkins University, Laurel, USA*)  
Anisotropy of piezoelectricity in drawn copolymers of vinylidene fluoride and trifluorethylene  
A.J. Day, G.R. Davies, E.L.V. Lewis and I.M. Ward (*University of Leeds, UK*)  
Conducting polymers based on high molecular weight poly(arylene vinylenes)  
R.W. Lenz (*University of Massachusetts, Amherst, USA*)  
Recent developments in the synthesis of conjugated polymers: potential electroactive polymers  
W.J. Feast (*University of Durham, UK*)
- 4.00 TEA AND CLOSE OF CONFERENCE

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This programme is provisional and the organizers reserve the right to make any changes which may be necessary.