

International Union of Pure and Applied Chemistry



**IUPAC
INTERNATIONAL
SYMPOSIUM**

**ON IONIC
POLYMERIZATION**

**October 22-26, 2001
Creta Maris Hotel
Crete, Greece**

IP' 2001

Book of Abstracts

International Union of Pure and Applied Chemistry



**INTERNATIONAL SYMPOSIUM ON IONIC
POLYMERIZATION**

**October 22-26, 2001
Creta Maris Hotel
Crete, Greece**

Book of Abstracts

Chairman: Nikos Hadjichristidis (Greece)
Honorary Chairman: Andrew Lovinger (USA)

Scientific Committee

K. Almdal (Denmark)	M. van Beylen (Belgium)
F. Ciardelli (Italy)	G. Fytas (Greece)
Y. Gnanou (France)	G. Guerra (Italy)
D. Haddleton (U.K.)	H. Höcker (Germany)
T. E. Hogen-Esch (USA)	R. Jérôme (Belgium)
A. Khokhlov (Russia)	C. Y. Kim (Korea)
S. Kobayashi (Japan)	A. Müller (Germany)
S. Penczek (Poland)	R. Quirk (USA)
J. Roovers (Canada)	M. Sawamoto (Japan)
T. Shopov (Bulgaria)	S. Sivaram (India)
D. Theodorou (Greece)	J. P. Vairon (France)
O. Vogl (USA)	G. Wegner (Germany)
Y. Yagci (Turkey)	R. Young (U.K.)

Organizing Committee

H. Iatrou (Athens)	A. Pispas (Athens)
M. Pitsikalis (Athens)	S. Anastasiadis (Crete)
G. Floudas (Crete)	M. Kosmas (Ioannina)
D. Vlassopoulos (Crete)	C. Vlachos (Ioannina)
C. Tsitsilianis (Patras)	J. Kallitsis (Patras)
	J. Mikroyannidis (Patras)

**INTERNATIONAL SYMPOSIUM ON IONIC
POLYMERIZATION**

Conference Programme

October 22-26, 2001

Creta Maris Hotel

Crete, Greece

All sessions will be held in the Creta Maris Hotel Conference Centre. The Invited Lectures will have 20 minutes for presentations and 5 minutes for discussion. The Talks will have 10 minutes for presentations and 5 minutes for discussion. The Posters will be displayed during three evening sessions.

Sunday, October 21, 2001

18:30 - 20:00

Welcome Reception at the Creta Maris Hotel (On the terrace of the Romantic Bar in the main building).

Monday, October 22, 2001

- 08:00 Registration
- 08:00 - 08:30 Opening Ceremony
- Morning Session A** **Anionic Polymerization**
Chairmen: R.Quirk/V.Ruiz
- A.I 1** 08:30 - 08:55 *The Consequences of Self-Assembly in Lithium Based Anionic Polymerizations.* **L. J. Fetters* (USA)**
- A.I 2** 08:55 - 09:20 *Methods for Preparing Tailor Made Branched Polymers.* **Jacques Roovers.*(USA)**
- A.I 3** 09:20 - 09:45 *Synthesis of Star-Branched Polymers and Multi-Functionalized Polymers by Means of Living Anionic Polymerization with Functionalized 1,1-Diphenylethylene Derivatives.* **Akira Hirao* (Japan)**
- A.I 4** 09:45 - 10:10 *Modification of Some Three Armed Star Polymers.* **Ronald R. Young*, Mohamed Moniruzzaman, Andrew Pryke, Patrick Fairclough. (UK)**
- A.I 5** 10:10 - 10:35 *Synthesis and Properties of Linear and Branched Polymers and Copolymers Based on 1,3 - Cyclohexadiene.* **Kunlun Hong, Jimmy W. Mays*(USA)**
- 10:35 - 10:55 **COFFEE BREAK**
- A.I 6** 10:55 - 11:20 *Synthesis of Light Harvesting Macrocyclic Polymers Containing Pendent Donors and Single or Duplicate Energy Acceptors. Energy Transfer Studies.* **Gennadi G. Nossarev, Xi Zhang, Eric S. Tillman, Jerainne Johnson , Stephen E. Bradforth and Thio E. Hogen-Esch*(USA)**
- A.I 7** 11:20 - 11:45 *Ring-Opening Polymerization.* **Hoecker Hartwig*, Keul Helmut (GERMANY)**
- A.I 8** 11:45 - 12:10 *Anionic Polymerization of Silylated HEMA: Polymerization Kinetics and Synthesis of Azo-Functional Styrene-Butadiene-HEMA Triblock Copolymer.* **Breiner, Thomas; Schmidt, Hans-Werner; Müller, Axel H. E.* (GERMANY)**
- A.I 9** 12:10 - 12:35 *Stereocontrol in Anionic Polymerization of Polar Monomers.* **Tatsuki Kitayama*(JAPAN)** *MINJURE*
- A.I 10** 12:35 - 13:00 *Poly(Dimethylsilmethylene)s Obtained by Ring Opening Polymerization of Substituted Disilacyclobutanes.* **BOILEAU Sylvie*, LESTEL Laurence, TRONC Frédéric, ZUNDEL Thomas**

(FRANCE)

- A.I 11** 13:00 - 13:25 *Model Polyolefin Block Copolymers Containing Polar Segments.* **Marc A. Hillmyer,* Andrew S. Zalusky, Roberto Olayo-Valles, Yunbing Wang, Esther M. Frick, and Scott C. Schmidt (USA)**
- 13:25 - 15:00 **LUNCH**
- Afternoon Session A** **Anionic Polymerization**
Chairmen: A. Hirao/J. Mays
- A.I 12** 15:00 - 15:25 *Reactions of Polymeric Organolithium Compounds with Ethylene Oxide in Hydrocarbon Solution: Characterization of Hydroxyethylation, Oligomerization and Polymerization Products*
Quirk*¹, Roderic P.; Mathers¹, Robert T.; Wesdemiotis², Chrys; Arnould², Mark A. (USA)
- A.I 13** 15:25 - 15:50 *Synthesis by Living Ionic Processes, Surface Functionalization and Properties of Regular Unimolecular Nanoparticles.* **Zainuddin Muchtar, Julien Bernard, Michel Schappacher and Alain Deffieux*(FRANCE)**
- A.I 14** 15:50 - 16:15 *Model Star Polymers with a Fullerene C₆₀ Core.*
Audouin Fabrice, Nuffer Richard, Picot Claude and Mathis Claude*(FRANCE)
- 16:15 - 16:30 **COFFEE BREAK**
- A.I 15** 16:30 - 16:55 *An Improved Method for Synthesis of Triblock SBS Copolymers.*
Hofmans Jurgen, Maseele Lieve, Van Beylen Marcel*(BELGIUM)
- A.I 16** 16:55 - 17:20 *Synthesis of Well-Defined Star Block Copolymers Using 1,1 Diphenylethylene Chemistry.* **Dumas* Philippe, Delaite Christelle, Hurtrez Guy (FRANCE)**
- A.I 17** 17:20 - 17:45 *High Molecular Weight Functionalized Poly(Ethylene Oxide). Synthesis and Associating Properties.* **Dimitrov, Philip¹; Hasan, Erol¹; Dworak, Andrzej²; Trzebicka, Barbara²; Tsvetanov, Christo B.*¹ (BULGARIA¹) & (POLAND²)**
- A.O 1** 17:45 - 18:00 *Complex Polymer Architectures by Convergent Living Anionic Polymerization.* **Daniel M. Knauss* and Tianzi Huang (USA)**
- A.O 2** 18:00 - 18:15 *Anionic Living Polymerization of Isocyanates in The Presence of Sodium Tetraphenylborate*

Jun-Hwan Ahn, Yeong-Deuk Shin And Jae-Suk Lee*(KOREA)

A.O 3 18:15 - 18:30

Copolymerization of N,N-Dimethylacrylamide with Styrene and Butadiene: The First Example of Polar Growing Chain End - Nonpolar Monomer Cross-Initiation
Arest-Yakubovich, Alexander*¹, Nakhmanovich, Boris¹, Müller, Axel² (RUSSIA¹ & GERMANY²)

A.O 4 18:30 - 18:45

Anionic Synthesis of Star-Branched Polymers Consisting of Poly(Tert-Butyl Methacrylate)s.
Akira Matsuo* and Akira Hirao (JAPAN)

19:00 - 20:00

POSTER SESSION A

A.P 1

Anionic Polymerization of Nylon 6: Route to Synthesize fast Curing Blends of Epoxy Resin and Nylong 6. **Reena Singhal*, Alka Gupta, A. K. Nagpal (INDIA)**

A.P 2

Synthesis And Characterization of Star Polymer Containing Hyperbranched Polycaprolactone
An Sung-Guk* and Cho Chang-Gi (KOREA)

A.P 3

Aggregation of Active Species of Living Polystyrene with Sodium and Lithium Counterions.
Pakuro Natalia*, Bobyleva Anna, Rogozhkina Elena, Akhmeteva Evgenia, Arest-Yakubovich Alexander (RUSSIA)

A.P 4

Tert-Butylmethacrylate Polymerization with Tributyltinlithium and Tributyltinsodium. **Pakuro Natalia*, Shcheglova Larisa, Arest-Yakubovich Alexander, Rogozhkina Elena, Akhmeteva Evgenia, Petrovskii Pavel (RUSSIA)**

A.P 5

Reactive Polymers Bearing Styryl Pendants Through Selective Anionic Polymerization of 4-Vinylbenzylmethacrylate. **Durairaj Baskaran*(USA)**

A.P 6

Star Polymers from a Novel Tetracarbanionic Initiator.
Lebreton Arnaud*, Héroguez Valérie, Gnanou Yves (FRANCE)

A.P 7

Synthesis of Star-Like Poly(Ethylene Oxide)s. **Daniel Taton*, Jennifer Logan, Sijian Hou, Yves Gnanou (FRANCE)**

A.P 8

Ab Initio Study of Active Species Structure and Reactivity in The Initiation Step of The Anionic Polymerization of Ethylene and Styrene. **Pierre VERSTRAETE^{1,2*}, Alain DEFFIEUX², Alain FRITSCH¹, Jean Claude RAYEZ¹, Marie Therese RAYEZ¹ (FRANCE)**

- A.P 9** *Anionic Suspension Polymerization of Protected Glycidol. Ethylene Oxide/Glycidol copolymers and hydrogels.*
Dimitrov, Philip^{1*}; Doycheva, Maria¹; Dworak, Andrzej²; Trzebicka, Barbara²; Tsvetanov, Christo B.¹
(BULGARIA¹ & POLAND²)
- A.P 10** *Graft Copolymers Composed of High Molecular Weight Poly(Ethylene Oxide) Backbone and Poly(N-Isopropylacrylamide) Side Chains and Their Thermoassociating Properties.*
Hasan, Erol* ; Jankova, Katya¹; Samichkov, Vasil²; Ivanov, Yachko²; and Tsvetanov, Christo B (BULGARIA)
- A.P 11** *Synthesis of Hybrid Block Copolymers as Precursors for Silicon Carbonitride.*
Fushun Yang^{a*}, Volker Abetz^a, Axel H. E. Müller^a, Günter Motz^b, Jürgen Hacker^b (GERMANY)
- A.P 12** *Copolymers from End-Functionalized Polyethers And 1,3-Butadiene. Mabel Graf* and Axel H. E. Müller (GERMANY)*
- A.P 13** *Study of the Synthesis of ABA-Triblock COPOLYMERS in Non Polar Medium Initiated by Dilithium Initiators in The Presence of π -Complexing Agents. Janssens Kristof * and Van Beylen Marcel (BELGIUM)*
- A.P 14** *Asymmetric Anionic Polymerization of Achiral and Chiral N-Substituted Itaconimide with Chiral Ligand/Organometal Complexes. Tsutomu Oishi*, Kenjiro Onimura, and Hiromori Tsutsumi (JAPAN)*
- A.P 15** *Asymmetric Anionic Polymerization of Chiral N-(1-Cyclohexyl)Ethylmaleimide. Kenjiro Onimura*, Hiromori Tsutsumi, and Tsutomu Oishi (JAPAN)*
- A.P 16** *ω -Lithium Poly(styrene-isoprene) Sulfonates. Synthesis, Characterization and Association Properties in Solution. Kondylia Sotiriou*, Stergios Pispas, Nikos Hadjichristidis (GREECE)*
- A.P 17** *Block Copolymers with Crystalline-Amorphous, Crystalline-Polyelectrolyte and Amorphous-Polyelectrolyte Blocks. Stergios Pispas* and Nikos Hadjichristidis (GREECE)*
- A.P 18** *Surface Initiated Anionic Polymerization: Homopolymers and Block Copolymers.*
G. Sakellariou*, S. Pispas, N. Hadjichristidis (GREECE)
Q. Zhou, J. Mays, M. Park, R. Advincula (USA)

- A.P 19** *ω -Functionalized Polystyrenes with One, Two and Three Zwitterionic Groups: Synthesis, Dilute Solution and Adsorption Properties.* **G. Sakellariou***, **S. Pispas, N. Hadjichristidis (GREECE)** **M-K. Park, R. C. Advincula (USA)**
- A.P 20** *Self-Assembly of Polyelectrolyte Block Copolymers Into Polyion Complex Micelles.* **Stefan Schrage***, **Helmut Schlaad, Markus Antonietti (GERMANY)**
- A.P 21** *Synthesis and Morphology of Block Copolymers Containing π -Conjugated Molecules.* **Hayakawa Teruaki***, **Horiuchi Shin, Shimizu Hiroshi, Nakahama Sei-ichi (JAPAN)**
- A.P 22** *Synthesis and Aqueous Solution Properties of an ABA Triblock Polyampholyte.* **Basiliki Sfika and Constantinos Tsitsilianis* (GREECE)**
- A.P 23** *Quantum-Chemical Studies of the Effect of μ - and σ -Ligands on Aggregation and Dissociation of PMMA-Li Chain Ends in THF and Toluene.*
Yakimansky, Alexander V.; Müller, Axel H. E.* (GERMANY)
- A.P 24** *Synthesis of Dendritic Macromolecules by Using Anionic Polymerization and Monomer/Linking Agents.* **Ioanna Chalari*** and **Nikos Hadjichristidis (GREECE)**
- A.P 25** *Synthesis of Cyclic Triblock Terpolymers.*
Dimitris Pantazis* and Nikos Hadjichristidis (GREECE)
- A.P 26** *Model Linear and Star-Shaped Homo- and Block Copolymers of 2-Methyl-1,3-Pentadiene with Styrene or Butadiene Synthesis-Characterization-Morphology.*
Anastasios Mavroudis**, **Apostolos Avgeropoulos^a**, **Nikos Hadjichristidis^a** and **Edwin L. Thomas^b (GREECE^a & USA^b)**
- A.P 27** *Synthesis and Microphase Separation of Linear Triblock Terpolymers of Polystyrene, High 1,4-Polybutadiene and High 3,4-Polyisoprene.* **Apostolos Avgeropoulos****, **Nikos Hadjichristidis^a** and **Edwin L. Thomas^b (GREECE^a & USA^b)**
- A.P 28** *Block Copolymers of Polystyrene and Poly(Alkyl Methacrylates) Micellization Behavior in Various Selective Solvents.* **Marinos Pitsikalis*** and **Nikos Hadjichristidis (GREECE)**
- A.P 29** *Linear and Star Polyisoprenes with Zwitterionic Phosphoric End-Groups.*

Synthesis, Characterization and Association Behavior in Dilute Solutions. **David Charalabidis***, **Marinos Pitsikalis** and **Nikos Hadjichristidis (GREECE)**

A.P 30

Synthesis, Characterization and Micellar Behavior of Model Cyclic Polybutadiene-Polystyrene Block Copolymers. **Hermis Iatrou*** and **Nikos Hadjichristidis(GREECE)**
L. Willner, G. Meier, H. Frielinghaus and M. Monkenbusch (GERMANY)

A.P 31

Linear Diblock and Triblock Copolymers of 2-Vinylpyridine and Ethyleneoxide Synthesis – Characterization – Properties. **Panagiota G. Fragouli,* Hermis Iatrou Nikos Hadjichristidis (GREECE)**

A.P 32

Anionic Polymerization of Styrene with Lithium as Counterion in Cyclohexane, Kinetics and Mechanism Part I: Effect of Durene.
Wang Guoming* Van Beylen Marcel (BELGIUM)

A. P 33

Macromolecular Architecture: Model Exact Graft Copolymers of Isoprene and Styrene with Two Branches. Synthesis- Characterization- Morphology.
Stella Paraskeva* and Nikos Hadjichristidis (GREECE)

Tuesday, October 23, 2001

Morning Session B

Cationic Polymerization
Chairmen: S. Penczek/R.Faust

B.I 1 08:30 - 08:55

Synthesis and Application of Water Compatible Graft Copolymers by Macromonomer Approach.
Wegner, G*, Baum, P. (GERMANY)

B.I 2 08:55 - 09:20

Control of MW, PDI, End-Groups, and Kinetics in Living Polymerization of Cyclic Esters.
Stanislaw Penczek (POLAND)

B.I 3 09:20 - 09:45

Controlled Cationic Polymerization of Cyclic Monomers. **T. Endo* and F. Sanda (JAPAN)**

B.I 4 09:45 - 10:10

A New Type of Block Copolymerization with 'One-Shot' Feeding of Monomers. **T. Saegusa, * K. Awi, M. Miyamoto, Y. Chujo (JAPAN)**

B.I 5 10:10 - 10:35

Branched Multihydroxyl Polyethers by Cationic Polymerization of Hydroxymethyloxetanes. **Bednarek M, Chen Y, Kubisa P,* Penczek S. (POLAND)**

10:35 - 10:55

COFFEE BREAK

**A.I 13 SYNTHESIS BY LIVING IONIC PROCESSES, SURFACE
FUNCTIONALIZATION AND PROPERTIES OF REGULAR UNIMOLECULAR
NANOPARTICLES.**

Zainuddin Muchtar, Julien Bernard, Michel Schappacher and Alain Deffieux*

Laboratoire de Chimie des Polymères Organiques, UMR ENSCPB-CNRS 5629
Université Bordeaux 1, 16 Avenue Pey Berland, 33607 Talence Cedex France

With the aim to develop specific properties required for new applications, an intense research activity is presently devoted to the design and study of polymers with well-controlled chain parameters and special chain topology of increasing complexity. One important domain concerns the design of functional hyper branched polymers which can fill the gap between low molar masses dendrimers and micrometric polymer particles. One route for the synthesis of hyper branched polymer that we have recently developed^{1,3} consists in assembling, through polymer analogous reactions, macromolecular building blocks of controlled structure and dimensions. This procedure is based on the successive and repeated interconnection of poly(chloroethyl vinyl ether) backbones and polystyrene or polybutadiene elementary blocks, prepared by living type polymerizations in order to control their dimensions and functionality. The covalent link between the elementary blocks is achieved by the selective coupling of living carbanionic polymers and the chloroethyl ether functions of the poly(chloroethyl vinyl ether) units. This strategy allows the preparation of monodispersed hyper-branched molecular objects with narrow polydispersity (<1,2) and controlled molar masses (up to several hundred millions), size (from ten to two hundred nanometers), shape and surface functionality (hydroxy-, carboxy-, cationically and anionically charged, etc).

The synthesis of these nanometric objects of persistent shape as well as some of their specific properties in the bulk and in solution will be presented.

References :

- 1 A. DEFFIEUX, M. SCHAPPACHER, *Macromolecules*, **1999**, *32*, 1797
- 2 M. SCHAPPACHER, A. DEFFIEUX, *Macromolecules*, **2000**, *33*, 7371
- 3 Z. MUCHTAR, M. SCHAPPACHER, A. DEFFIEUX, *Macromolecules*, in press

AUTHOR INDEX

Mavroudis	A.	48
Mays	J.W.	6,40,167,200
Mazurak	Z.	104
Meier	G.	52
Michler	G.H.	126
Mihailescu	M.	111
Miyamoto	M.	60
Moeller	M.	116
Monge	S.	148
Moniruzzaman	M.	5
Monkenbusch	M.	52,111
Montoya	I.	81
Moreau	M.	64,68,81,83
Morejko-Buz	B.	104
Morii	H.	141
Mortensen	K.	115,150
Motz	G.	33
Muchtar	Z.	14
Mueller	K.	132
Mueller	A.H.E.	9,21,33,34,45,93,94,101
Mueller	A.J.	121
Nagahata	R.	163
Nagpal	A.K.	23
Nakahama	S.-I.	43
Nakano	T.	185
Nakata	S.	72
Nakhmanovich	B.	21
Navarro	C.	109
Nguyen	H.A.	76
Nolte	R.J.M.	133
Norton	P.R.	65
Nossarev	G.G.	7
Novak	B.M.	182
Nuffer	R.	15
Ober	C.K.	122
Ohmae	M.	141
Ohno	K.	170
Oishi	T.	36,37
Okamoto	Y.	178,185
Okuyama	K.-I.	163
Olayo-Valles	R.	12
Onimura	K.	36,37
Pae	Y.	138
Pakula	T.	93
Pakuro	N.	25,26
Pantazis	D.	47
Pantoustier	N.	67
Paraskeva	S.	55
Park	M.-K.	40,41
Pascual	S.	169
Patrick	J.	164
Patrickios	C.S.	154,190
Pedeutour	J.-N.	195
Penczek	S.	58,61,84,86
Percec	V.	130
Pergushov	D.V.	94
Peruch	F.	188
Petrovskii	P.	26
Picot	C.	15
Piontech	J.	199
Pispas	S.	38,39,40,41,118
Pitsikalis	M.	50,51,155,161
Po	R.	162

Under the Auspices of



**International Union of Pure and Applied
Chemistry**

**Ministry of Education and Religious Affairs
Ministry of Culture
University of Athens
Greek Polymer Society
European Polymer Federation
Greek Chemists Association**

Sponsors

**Ministry of Education and Religious Affairs
Ministry of Culture
ExxonMobil Research and Engineering Company, USA
ExxonMobil Chemical, European Sci. & Eng. Programme
BASF
MALVA Ltd-WATERS
Techline S.A.
Agmartin
ΑΝΑΛΥΤΙΚΕΣ ΣΥΣΚΕΥΕΣ Α.Ε./Δρ. Κ.Ι ΒΑΜΒΑΚΑΣ**