Division Minutes Glasgow 2010 Version 3.0 Provisional

IUPAC POLYMER DIVISION MEETING
Strathclyde University
Glasgow, Scotland
09.30–12.30 & 14.00–17.30, 10th of July
09.00-12:30, 11th of July 2010

Those attending: Dušan Berek (Slovakia), Michael Buback – Vice President (Germany), Taihyun Chang (Korea), Dick Dijkstra, Germany, Claudio dos Santos (Brazil), Giancarlo Galli (Italy), Kurt E. Geckeler, (Korea)-observer, Aubrey Jenkins (UK), Jiasong He (China), Michael Hess – Secretary (Germany), Roger Hiorns (France), Phil Hodge (UK), Jung-II Jin (Korea), Richard G. Jones (UK), Joon-Soep Kim (Korea), Tatsuki Kitayama (Japan), Pavel Kratochvíl (Czech Republic), Przemysław Kubisa (Poland), Stefano Valdo Meille (Italy), Graeme Moad (Australia), Werner Mormann (Germany), Christopher Ober – Division President (USA), Stanislaw Penczek (Poland), Greg Russell (New Zealand), Mitsuo Sawamoto (Japan), François Schué (France), Ram Prakash Singh (India), Dennis Smith (USA), Jaroslav Stejskal (Czech Republic), Miroslava Trchová (Czech Republic), Jean-Pierre Vairon (France), Jiri Vohlidal (Czech Republic), Majda Žigon (Slovenia).

Temporarily present as guests were Peter Lovell (Organizer MACRO 2010, University of Manchester, UK), Tim Long and Richard Turner (Organizer MACRO 2012, Virginia Tech, USA).

1. President’s Introductory Remarks and Finalization of the Agenda

Chris Ober welcomed the Division members and observers to the Division meeting in Glasgow. He also very cordially welcomed the Past President of IUPAC and his predecessor as President of the Polymer Division, Jung-II Jin. The previously distributed meeting agenda was briefly discussed and accepted (see Appendix I). While the Polymer Division continues to be one of the most active Divisions concerning handling and attracting IUPAC projects, nevertheless continuous efforts are required to maintain this high standard and to improve it. In particular, the Division is involved in a number of interdivisional projects with Division VIII and Division II (Interdivisional Subcommittee on Materials Chemistry). Finally, Chris Ober asked for a moment of silence in remembrance of Prof. Itaru Mita (Japan), an active member of the Division for many years, who passed away recently.

2. Apologies for Absence

Absent members sent their apologies together with greetings to the Division. Bob Steptoe fell ill just before the meeting. His absence was deeply felt and the Division expressed its best wishes for soon recovery.

3. Approval of the Minutes of the Division Committee Meeting, Glasgow-Crowne Plaza Hotel
The minutes recorded from the 2009 meeting in Glasgow were accepted with no dissenting vote.

4. Matters Arising

No specific item not on the meeting agenda had to be addressed at this point.

5. Report on Structure–Properties Projects (Dijkstra)

After the retirement of Sung-Chul Kim (Korea) the Subcommittee Structure Properties of Commercial Polymers (SC) will be led by Dick Dijkstra (Chairman), Bayer MaterialsScience, Germany, Jiasong He (Co-chairman), Chinese Academy of Sciences, Beijing, China and Toshikazu Takigawa (Chair of the East Asian Meeting of the SC), University of Kyoto, Japan.

Dick Dijkstra presented a report on the activities of the Subcommittee on Structure–Properties of Commercial Polymers (SC). The Subcommittee currently involves 65 members from 12 countries. Membership is well balanced between academics and industry (33 from industry and 32 from academia).

Dick Dijkstra gave a short summary of the history of the Subcommittee, its structure, goals and ways to operate.

The following projects are active:

**IUPAC No. 2010-019-1-400**

*Characterization, rheology and mechanical properties of high and ultra-high molecular weight polyethylene*

Task Group Leader: Prof Clive Bucknall, Cranfield University, United Kingdom

**IUPAC No. 2008-028-1-400**

*Elongational rheometry devices for shear rheometers*

Task Group Leader: Dr Dietmar Auhl, POLY-Unité de chimie et de Physique des hauts polymères, Belgium

**IUPAC No. 2007-004-1-400**

*Guidelines for shear rheometer calibration and performance check*

Task Group Leader: Dr Maximilian Ruellmann, BASF, Germany

**IUPAC No. 2005-023-2-400**

*Microstructural, melt processing and mechanical properties of compatibilized PA6/ABS Blends*

Task Group Leader: Dr. Helge Steininger, BASF Aktiengesellschaft, Germany

**IUPAC No. 2004-044-2-400**

*Microstructure and Properties of Thermotropic Liquid Crystalline Polymer Blends and Composites*

Task Group Leader: Prof Jiasong He, Institute of Chemistry, CAS

**IUPAC No. 2003-051-1-400**

*Structure and Properties of polymer/clay nano-composite materials*

Task Group Leader: Prof Sung Chul Kim, KAIST, Korea
This project is almost completed.

IUPAC No. 2003-038-4-400

Structure and properties of linear and crosslinked structural polyvinylchloride (PVC) foams

Task Group Leader: Prof Volker Altstaedt, University Bayreuth, Germany

The feasibility study on Rheology and Processability of Foams (Task Group Leader Prof. Yamaguchi) is presently being evaluated to become a project as an important contribution of the East Asian Group.

The following publications appeared since the last report:


The East Asian Group has met in Jeju, South Korea, and the European Group in Lund, Sweden.

The International Year of Chemistry 2011 offers a good opportunity to address Industry again for support and initiation of new projects, in particular since the economical situation is improving.

6. Report on Terminology and Nomenclature Projects (Jones, Hiorns)

Dick Jones reported progress in the Subcommittee on Polymer Terminology (SPT) since the last meeting. The Secretary of the SPT has changed from Tatsuki Kitayama (Japan) to Roger Hiorns (France).

The SPT met in Glasgow (06th-09th June 2010) directly before the Division meeting. Annual meetings are to review the progress of all active projects and to lay plans for future initiatives. Within the Polymer Division, the definition of terminology in macromolecular and polymer science and technology is conducted under the auspices of the SPT to which Division VIII delegates the additional responsibility for guiding the progress of projects in polymer nomenclature. Phil Hodge is the Polymer Division’s representative in Division VIII. In the period covered by this report, the Subcommittee has worked on 24 projects, 7 of which are concerned with polymer nomenclature or are nomenclature-related.

Activities of the SPT since the Glasgow GA 2009

6.1 Publications since Glasgow 2009

2002-006-2-400 Terminology for reversible-deactivation radical polymerization previously called "controlled" radical or "living" radical polymerization, 2010, 82(2), pp. 483-491 - Jenkins, Jones & Moad


6.2 Projects approved

2007-008-1-400 *Multilingual Encyclopaedia* - dos Santos (extension)

2009-047-1-400 *Definitions and Notations Relating to Stereochemical Aspects in Polymer Science* – Hellwich & Moad

2010-007-1-400 *Terminology for Chain Polymerization* – Moad

6.3 Projects in the process of approval

2009-…-1-400 *Terminology of Nanomaterials and Nanotechnology in Polymer Science* – Ober & Jones

2010-…-1-400 *List of Key Words* – Kubisa

6.4 Projects with ICTNS & submitted for public review

2002-017-1-400 *Polymerization Processes and Polymers in Dispersed Systems* – Slomkowski

6.5 Projects in final stages of preparation

2001-081-1-800 *Terminology and Structure-Based Nomenclature of Dendritic and Hyperbranched Polymers* – Kahovec

2003-019-2-400 *Crystalline Polymers* – Allegra, Meille

6.6 Projects in Preparation by Working Parties

2003-060-2-400 *Terminology on Separation of Macromolecules* - Chang

2004-043-1-400 *Terminology for Biomedical (Therapeutic) Polymers* - Vert

2005-005-1-400 *Terminology Properties of Macromolecules in Solution* – Chang

2005-007-1-400 *Guide to Terminology and Nomenclature* – Jones

2005-043-1-400 *Self-Assembly and Aggregation in Polymers* - Ober, Jones

2006-004-1-400 *Abbreviations* - He, Tabak

2006-028-1-400 *Terminology for Stimulus Responsive Polymers* – Vohlidal

( *Terminology for Conducting, Electroactive and Field-responsive Polymers* )

2006-041-1-400 *Glossary of Thermal and Thermomechanical Properties of Polymers* - Hess

2007-008-1-400 *Multilingual Encyclopaedia* – dos Santos

2008-015-1-400 *Preferred names of Polymers* - Mormann

2008-020-1-400 *Revision of the Division IV web-based Terminology Guidelines* - Hodge

† Joint project of the Inorganic, Physical and Polymer Divisions.
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2008-032-1-400  Basic guidelines to polymer nomenclature – Hiorns
2009-047-1-400  Stereochemical Aspects in Polymer Science – Hellwich & Moad
2010-007-1-400  Terminology for Chain Polymerization – Moad

7.6 Interdivisional projects not listed elsewhere

1999-051-1-800  Source Based Nomenclature for Modified Polymer Molecules - Kitayama
2003-042-1-800  Revision of Source-Based Nomenclature of Homopolymers & Copolymers – Kitayama
2007-009-1-800  Nomenclature for Macromolecular Rotaxanes - Vohlidal

6.8 Proposed Projects

Terminology of Constitutionally-Dynamic Polymers
Nomenclature in Inorganic Polymers – Jones, Hiorns, Kahovec

6.9 Preparing for PB2 to go on-line.

In the following discussion Michael Buback suggested that the developments in the field of Polymer Nomenclature and Terminology should be directed purposefully to the attention of the leading journals and he strongly recommended republication of parts or the whole corresponding articles in Pure and Applied Chemistry. Pavel Kratochvil observed that at least a list of the valid recommendations of the Division should be submitted to the major journals. Dušan Berek proposed that this list could be quite short, and Dick Jones added that a condensed version of the content of the Division’s work on Nomenclature and Terminology comparable to the flyer that is existing of the Green Book should be considered.

Stan Penczek reminded the audience that the work done by the Division is outstanding although its visibility and public recognition is rather bad. Even new textbooks frequently do not recognize what has been done by IUPAC. Mitsuo Sawamoto expressed his doubts that publishers could be forced to join the IUPAC view. The editors of leading journals and the publishers of books should be addressed and the Division should offer to comment new publications with regard to nomenclature and terminology. Through some editors who are member of the SPT there is already connection to some publishers. These connections should be used to inspire more publishers to ask IUPAC for advice. The competence is present in the SPT. The topic would also be addressed during the meeting of the Subcommittee Education and on editorial meetings during MACRO 2010. Michael Buback observed that not only scientific terms but also ethical considerations are subject of IUPAC concerns. Roger Hiorns proposed the creation of an IUPAC Certificate for scientific journals and book publications, quite a number of publishers seem not even to be aware of IUPAC’s output. There is no real power to implement the use of IUPAC recommendations but the authorization of its free use should be made public (Mitsuo Sawamoto). Roger Hiorns observed that for example the journal Macromolecules prefers to use the CAS system. Jean-Pierre Vairon mentioned that the journals do not have the manpower nor the money to do the editorial checks that are being discussed; this had already been stated (Virgil Percec) during the ‘Round Table Meeting’ with the editors of leading journals who had been invited by the Division to discuss exactly these problems on the occasion of MACRO 2000 in Warzawa. Dick Jones put in that the situation has been presented to the Bureau with support of Jung-II Jin during his Presidency but the progress at
that level is apparently slow. Michael Buback declared Roger Hiorn’s project (2008-032-1-400 Basic guidelines to polymer nomenclature) a test case if the tendency of the idea behind it is showing the desired results. Dennis Smith suggested to have the other Divisions involved, who certainly are facing the same problem. Chris Ober recommended to have a more elaborate concept and to come up with more details on next year’s meeting. Mitsuo Sawamoto observed that nomenclature should be made acceptable for the user, and Michael Hess put in that there is a strong input from Division VIII in this field with emphasis on the point of view of the pure Organic Chemistry. Prof. Jin suggested to utilize Wikipedia for our purposes. Dušan Berek agreed and remarked that this would certainly reach the technical staff that is more involved with any practical realisation.

Jean-Pierre Vairon reported the French translation of the document ‘Terminology of Polymers Containing Ions or Ionizable Groups and of Polymers Containing Ions’, Pure and Applied Chemistry 78(11) 2067-2074 (2006). In the past all translations were recorded by the passed Val Metanomski at CAS. Dick Jones asked to bring all new translations from now on to his attention. He will also try to find the location of Val Metanomski’s collection of translations.

7. **Report on Molecular Characterization Projects (Dušan Berek)**

Dušan Berek reviewed the situation concerning characterization of polymers on the molecular level and asks IUPAC leadership in this field to make the vital problems known in the general scientific community. Industry is well aware of the problems involved, however, this knowledge remains frequently unpublished for obvious reasons. This is where IUPAC in particular can change the situation by conducting appropriate projects and making their results open to public establishing methods to handle the problems and provide access to well-defined standard materials, see for example D. Berek, J. Sep. Sci. 33 (2010) 315-335, and also below.

At the end of the year 2009 there were 22 Members of Subcommittee registered namely:

Dušan Berek (SAS, Slovakia)
Taihyun Chang (POSTECH, Korea)
Volker Dolle (Basell, Germany)
Petra Eiselt (ExxonMobil, USA)
Jana Falkenhagen (Federal Institute for Materials Res. & Testing, Germany)
Charles M. Gutman (NIST, USA)
Lars-Christian Heinz (DSM, Netherlands)
Xiangling Ji (Changchun Institute of Applied Chemistry, China)
Xulin Jiang (Wuhan University, China)
Shinichi Kinugasa (AIST, Japan)
Albena Lederer (Leibniz-Institut für Polymerforschung, Germany)
Vincent Mathot (Katholieke Universiteit Leuven, Belgium)
Gregorio R. Meira (INTEC, Argentina)
Ines Mingoazi (Basell, Italy)
Harald Pasch (DKI, Germany; University of Stellenbosch, S. Africa)
Chang Y. Ryu (RPI, USA)
Greg Saunders (Polymer lab. UK)
Bastiaan Staal (BASF, Germany)
Bernd Trathnigg (Karl-Franzens-Universität-Graz, Austria)
Freddy Van Damme (Dow, Netherlands)
Kim R. Williams (Colorado School of Mines, USA)
Sjoerd van der Wal (DSM, Netherlands)

**Ongoing Projects** are:

- **2005-011-3-400** (Nyambeni Luruli) 31.12.2010; spent: 47%
  *Repeatability and Reproducibility of Sample Preparation and Analysis in High-Temperature SEC*

- **2005-009-3-400** (Robert Bruell) 01.07.2008; spent 0%
  *Efficiency and Reproducibility of Temperature Rising Elution*

- **2005-021-3-400** (Bastiaan Staal) 31.12.2007; spent 0%
  *Accuracy and Reproducibility of Functionality Type Analysis of poly(ethylene oxide) homo- and copolymers by LCCC*

- **2004-022-3-400** (Melissa Fitzgerald) 30.04.2007; spent 6%
  *Terminology and Measurement Techniques of Starch Components*

- **2007-058-1-400** (Bob Gilbert) 31.03.2010; spent 44%
  *Critically evaluated techniques for size separation characterization of starch.*

A new project was initiated: **2009-015-1-400** (G. Meira), continuation of previous successful project 2003-023-2-400 and has been started early in the year 2010.

By the end of 2009, all project coordinators were repeatedly contacted, only two of them responded:
G. Meira (Santa Fe, Argentina) answered that his projects 2009-015-1-400 will start in 2010 (there were unexpected problems with project approval, lost of application forms…). Project ends 31.12.2012, July 2010. 43% were spent. The project participants will meet during International Symposium on Separation Sciences in Rome September 2010.

Ms. Nyambeni Luruli, promised to prepare a report. This was done in Spring of 2010. Ms. Luruli is however reluctant to prepare corresponding publication. It is hoped that she will eventually do it - though evaluation of round robin tests is a really exacting task.

The other four coordinators did not answer five consecutive e-mails. It is likely that they did not start with works on projects and did not accept any financial support from IUPAC.

Dušan Berek proposed closing of these projects. This raised the question who terminates a project. Chris Ober stated that this would be done by the task group leader or the Division President. Jung-II Jin suggested not just to close the projects but to explore the situation first and try to find new project leaders.

Over 80 potential Subcommittee members were contacted: over 30 expressed their interest to take part
in future activities. The present structure of the Subcommittee has Dušan Berek as Chairman and Taihyun Chang as Co-chair.

8. Reports on Developing Polymer Materials Systems (Jaroslav Stejskal)

Jaroslav Stejskal reported on the activities of the Subcommittee on Developing Polymer Materials and stated that the same problems already identified on the last meeting a year ago are prevailing: new project areas have to be identified and the future strategy of the Subcommittee has to be defined. Currently there are 25 members from 16 countries. Two members are from industry.

Projects

2006-018-2-400: Infrared spectra of conducting polymer nanotubes (Miroslava Trchová) is completed and the technical report has been submitted to Pure and Applied Chemistry in February 2010.

2006-028-1-400: Terminology for conducting, electroactive and field-responsive polymers (J. Vohlídal) is in an advanced stage.

Future projects are:

- **Raman Spectroscopy of Conducting Polymers** (various morphologies, interpretation of the spectra, structure-properties relations)
- **Carbonization of Conducting Polymers** (N-containing nanotubes)
- **Conducting Polymers and Noble Metals** (highly conducting materials, conducting incs, catalysts)
- **Conducting Polymers and Ionic Liquids** (mixed ionic/electronic conductors)

Jaroslav Stejskal and Miroslava Trchova are organizing a Symposium on conducting polymers in Praha in the year 2011 as contribution to the International Year of Chemistry.

Michael Buback stated that the Subcommittee suffers from the genuine problem that involvement of industry is essential and industry is well aware of the importance of this field, however, industrial partners hesitate to disclose details and to publish. Also, at the present time, the scope of the Subcommittee is rather limited and the perspective should be broadened. Merging with another Subcommittee should be considered. Jaroslav Stejskal agreed he has already invited to contribute more projects in the past. Graeme Moad assumed that there are connections with the projects Self-Assembly, Stimuli-Responsive Polymers, Chris Ober added Fluoro-Polymers and related Materials to be considered. Starch, conjugate polymers, responsive gels and star-shaped polymers were also mentioned, but apparently there is a strong need for a more detailed concept and concrete proposals are required.

Jung-II Jin suggested to start collecting ideas and identify possible task group leaders. Mitsuo Sawamoto saw the necessity to define the term ‘developing polymers’ more closely and saw the term covering energy, environmental, sustaining biocompatibility, electrical conductivity, photoconductivity, nanotechnology etc. correlated with this headline. Jean-Pierre Vairon saw the
present concept as being too vague and suggested to develop a decisive strategy for the coming 3 years. Chris Ober proposed to set-up a well-defined, not too broad project area including the names of potential task group leaders and he encouraged everybody to contribute ideas.


Any topic to be placed on the Division website should go through Dick Jones who checks for the format and forwards it. In particular the announcement of Conferences and new projects and publications are in particular items to be placed on the front page. There are still problems with the web site since the new design was created. There is still the new and the old version and there is some hope that they will eventually merge to the satisfaction of the users. Chris Ober is involved in the improvement and Fabienne Meyers is in contact with the Czech group that designs the website. The problems are identified but solutions are coming up very reluctantly, Chris Ober is ready to convey any proposals for improvement and the Division members are urgently asked to submit their thoughts.


The Subcommittee comprises 36 members from 13 countries: The list suffers from a misbalance in that there is no member from Austria any more and the number of members from the UK and the USA shows under-representation.

Modeling and mechanistic studies into free-radical polymerizations are important for science and industry, but often completely different model assumptions and parameter values are reported for ostensibly the same systems. The projects of the IUPAC Subcommittee “Modeling of Polymerization Kinetics and Processes” are to rectify this situation through international collaboration, by producing critically evaluated kinetic parameters, whose values are reliable and which can be used by the international polymer community. Moreover, reliable methodologies have been established by this IUPAC Subcommittee.

Benchmark propagation rate coefficients, \( k_p \), have been obtained for styrene, many methacrylates, butyl acrylate, methacrylic acid and vinyl pivalate by critical evaluation and also by independent experiments. These efforts are currently extended to termination rate coefficients, \( k_t \), initiation rate parameters, and RAFT and NMP polymerization kinetics.

**Publications (with citations as of 29 July 2009 & 6 July 2010)**

“Consistent values of rate parameters in free radical polymerization systems” 151 \( \rightarrow \) 155 citations

“Consistent values of rate parameters in free radical polymerization systems. Part II: Outstanding dilemmas and recommendations” 177 \( \rightarrow \) 184 citations
M. Buback, R. G. Gilbert, G. T. Russell, D. J. T. Hill, G. Moad, K. F. O'Driscoll,

“Consistent values of rate parameters in free-radical polymerization systems.” ?? → 27 citations


Publications – Propagation

“Critically evaluated rate coefficients for free-radical polymerization, 1. Propagation rate coefficients for styrene” 408 → 444 citations


“Critically evaluated rate coefficients for free-radical polymerization, 2. Propagation rate coefficients for methyl methacrylate” 307 → 336 citations


“Critically evaluated rate coefficients for free-radical polymerization, 3. Propagation rate coefficients for alkyl methacrylates” 106 → 123 citations


“Critically evaluated rate coefficients for free-radical polymerization, 4. Propagation rate coefficients for methacrylates with cyclic ester groups” 35 → 43 citations


“Critically evaluated rate coefficients for free-radical polymerization, 5. Propagation rate coefficient for butyl acrylate” 84 → 114 citations


“Critically evaluated rate coefficients for free-radical polymerization, Part 6. Propagation rate coefficient of methacrylic acid in aqueous solution” 8 → 18 citations


“Determination of the Propagation Rate Coefficient of Vinyl Pivalate based on EPR Quantification of Propagating Radical Concentration” 1 → 1 citation


“Critically evaluated propagation rate coefficients in free radical polymerizations, 1. Styrene and methyl methacrylate” ?? → 96 citations

**Publications – Termination and RDRP**

“Critically evaluated termination rate coefficients for free-radical polymerization –

1. The current situation” 72 → 86 citations


“Critically evaluated termination rate coefficients for free-radical polymerization.

2. Experimental methods” 45 → 56 citations


“Mechanism and Kinetics of Dithiobenzoate-Mediated RAFT Polymerization, 1. The Current Situation” 131 → 166 citations


**Publications – Terminology**

“Terminology for reversible-deactivation radical polymerization previously called “controlled” radical or “living” radical polymerization” unpublished → 1 citation


**Completed or Nearly Completed Projects:**

- Termination rate coefficients
- RAFT polymerization mechanism
- Radical polymerization terminology

**New or Relatively New Projects:**

- Chain polymerization terminology
- Initiation rate parameters
- NMP rate parameters

**Project 2000–028–1–400 (Russell) completion 2010**

(planned end was 30.06.2003)

“Critically evaluated termination rate coefficients for free-radical polymerization. 1. Current status, evaluation of experimental methods, data for styrene and methyl methacrylate”

**Publications**

(1) "Critically evaluated termination rate coefficients for free-radical polymerization,

1. The current situation" 86 citations

M. Buback, M. Egorov, V. Kaminsky, O. F. Olaj, G. T. Russell, P. Vana, G. Zifferer,
“Critically evaluated termination rate coefficients for free-radical polymerization. Experimental methods” 56 citations


The work for a third publication, on reliable termination rate coefficients for styrene (possibly also methyl methacrylate) has been completed

A project summary will then be published as a Technical Report in *Pure and Applied Chemistry*.

**Project 2004 – 040 – 1 – 400 (Philipp Vana)**

Towards a holistic mechanistic model for reversible addition-fragmentation chain transfer (RAFT) polymerizations:

Dithiobenzoates as mediating agents

**Project status**

First milestone (“dilemma” paper): completed

Current undertaking: A project summary is being prepared for *Pure and Applied Chemistry*. It will present consensus views on mechanistic models:

- Slow fragmentation
- Intermediate termination
- “Missing step” model
- Other models

**Future work:** It is hoped to start a new project on critically evaluated kinetic parameters for RAFT polymerizations

**New Project 2010–007–1–400 (Graeme Moad) approved April 2010**

“Terminology for chain polymerization”

Not a Subcommittee project per se, but it arose out of the RDRP terminology project, and will also actively involve members of this Subcommittee.

**New Project 2009–050–1–400 (Graeme Moad) approved April 2010**

“Critically evaluated rate coefficients associated with initiation of radical polymerization”

**New Project 2010–027–1–400 (Dennis Bertín) approved April 2010**

“Critically evaluated dissociation rate coefficients for alkoxyamines”

**New Project Proposals – Following Currently Concluding Projects**

Michael Buback and Greg Russell

“Critically evaluated rate coefficients for chain-length-dependent termination”

Philipp Vana

“Critically evaluated rate coefficients for trithiocarbonate-mediated RAFT polymerization”
Future Project Ideas

“Critically evaluated termination rate coefficients as a function of conversion”
“Critically evaluated chain-transfer rate coefficients and constants”
“Critically evaluated depopagation rate coefficients”
“Critically evaluated copolymerization reactivity ratios”
“Critically evaluated combination/disproportionation ratios”

“ATRP: current situation on mechanisms; benchmark rate coefficients \( k_p \) for PEGylated MMA”
“Primary radical addition”
“Quantum-chemical calculation of RP rate coefficients: guidelines”
“Critically evaluated rate coefficients for ionic polymerizations”
“Set of benchmark rate coefficients for a particular monomer”
“Sensitivity of modeling to rate coefficient precision”

A “Critical evaluation” as mentioned above always includes recommendation of methods and issuing of guidelines for their use.

Stan Penczek acknowledged the success of the work of the Subcommittee and raised the question why the focus lies on radical polymerization processes. This has mere historical reasons, was the answer, and as mentioned before treatment of ionic polymerization processes are considered for the near future.

11. Reports on Education Projects and Activities (Jean-Pierre Vairon)

Educational Courses, Workshops and Conferences

Three main events have been installed on an ongoing basis: the UNESCO/IUPAC Post-graduate Course in Polymer Science in Prague, the Short Course Polymer Characterization linked with the annual POLYCHAR conference, and the Annual UNESCO/IUPAC Workshop and Conference in Stellenbosch (SA). All are well recognised and definitely contribute to the development and diffusion of polymer education worldwide.

Design of Polymer Education Material for French Speaking Countries

Based on the Project 2004-037-1-400 in conj. with CCE and completed June 2009. All the contents will be installed soon on the French Polymer Group website. They will be available from the IUPAC Poly Edu web via the link with GFP. A further step would be now to implement an « on-line » french speaking lecturing network, particularly with new educational material (videoclips, etc..). This should be submitted as a new educational IUPAC project (Task leaders: Th. Hamaide, L. Fontaine).

Elaboration of an IUPAC sponsored CD on Polymer Education

Task Leader: C. K. Ober

The CD is available on the IUPAC Polymer Education Website and the project is considered finished.

Developing of the Division IV - Polymer Education Website

Task Leaders: C. K. Ober, J.-P. Vairon
The links with the existing national polymer education subgroups and/or national polymer groups are, with their agreement, progressively added on our PolyEdu website, together with polymer education materials approved by the sub-committee <http://old.iupac.org/polyedu/>. It must be noticed that these web accessible polymer teaching materials in the different countries are still rather limited but growing.

**Polymer Teaching video clips data base**

Task Leader: W. Mormann

After various attempts by the task group leader to approach organizations (Polymer Division of GDCh, Plastics Europe) and companies (Bayer, BASF) there has not been positive resonance. Following the recommendation of the task leader the subcommittee decided to abandon this task.

**Boosting the Polymer Education in Africa**

As no action was undertaken since 2006, the sub-committee decided to abandon this task.

**Reviewing of polymer science textbooks**

Task Leader: St. Penczek

Jean-Pierre Vairon gave a short review of the proposal presented by Stan Penczek on the occasion of the year 2009 meeting. It was suggested that now the Division President and the Chair of the SPT should contact major publishers of text books of Polymer Science and carefully explain the Division’s offer to be helpful in improving the use of the up- to-date terminology and nomenclature in new or newly edited textbooks of Polymer Science according to the guidelines formulated during the 2009 meeting of the Subcommittee Education.

**IUPAC Polymer Chemistry Funding Opportunities**

Task Leaders: C. Ober, J.-P. Vairon, W. Mormann, D. Smith


**Conclusions on the 2009-2010 activities**

The conclusions related to the 2009-10 period are exactly similar to the ones of the 2009 report. As decided at the previous sub-committee meeting Glasgow 2009, the WP Polymer Teaching video clips data base and Boosting the Polymer Education in Africa have been abandoned. The activity on the Polymer Education CD is now complete. Apart from recurrent activities – we are pleased to see that the UNESCO/IUPAC Conference and Workshop in Stellenbosch is again programmed, the main current actions concern the multinational call for proposals and the WP7-Polymer Textbook reviewing. Nevertheless, we have to admit that i) there are few countries really innovating in terms of polymer education, ii) the interactions between countries are almost nonexistent in the domain, iii) the young teachers are mostly evaluated through their research production and generally avoid to develop time consuming teaching innovations. A critical assessment of the polymer education activities worldwide appears necessary to propose an effective programme.

12. **Monitoring of Projects (Buback)**

Michael Buback stressed the importance of the visibility of the Division’s work in the scientific
community so that a significant resulting impact follows the Divisions publications either evident by the number of quotations of technical papers or by the use of the recommended terms and nomenclature. The initiative of Stan Penczek’s project to improve the impact of the Division’s work through proper use of IUPAC nomenclature and Terminology in textbooks is an important action.

The long duration of projects have to be a major concern of the task group leaders. While there were 27 projects started 2006 or earlier only 6 of them are listed as completed. The average duration of 6 years appears to be significantly too long. Knowing about the long time it takes to produce a recommendation will not encourage the scientific community to request recommendations from IUPAC. Some of the reasons for the long duration are the voluntary basis of the work of the WP members and the limited time that is conceded to members from industry by their companies. As a solution the Vice-President proposes to finish the pending projects early 2011 and to clean the file by the end of February next year. Also care should be taken to have the results of our work published without delay and monitor the citations. People of potential interest in our work should be contacted and helpful suggestions from outside should be treated efficiently since in particular companies want to see the benefit of their input. Annual reports should be standard, and reasons should be given if extensions are required. Those however, should only be short extensions. New projects should be carefully selected and well prepared. The corresponding Subcommittees should give a statement on each project proposal. The envisaged duration should not exceed three years and overdue projects should be terminated. Michael Hess observed that this criterion cannot be valid for the Multilingual Encyclopedia Project. Project ideas should be gained from outside IUPAC.

Jung-II Jin agreed with each of the items addressed by Michael Buback and recommended to strictly follow the monitoring system that was established during the Presidency of Bob Stepto and that was already long-time practice in the SPT. Jean-Pierre Vairon suggested that the existing rules should be more efficiently structured and particular attention should be put on the new projects. Stan Penczek recommended a continuous monitoring of the citations. This, however, is not a valid indicator in case of Nomenclature/Terminology recommendations. Pavel Kratochvil quoted from his long experience in the Division and stated that a 2-3 years duration for a project in Terminology or Nomenclature is unrealistic. The face-to-face discussion of the problems is essential but it is usually not possible to meet more than once a year. Dick Jones agreed and as Chair of the SPT stated that in this area about 5 condensed meetings are required. Usually those meetings are arranged in connection with the biennial MACRO Conference respectively the IUPAC GA. Dick Dijkstra agreed that also for his Subcommittee 3 years of duration for an average project are not sufficient. Chris Ober asked in as how far the Division IV activities fit in with the other Division’s projects. Jung-II Jin responded that Division I and II are involved in a number of Projects with Division VIII. During his Presidency he has cancelled some overdue projects. Dick Jones put in that some of the delays for terminating a project are due to a back and forth with ICTNS. Projects that last too long frequently lose their task group leader and the Subcommittee Chair needs to keep an eye on that. Pavel Kratochvil observed that there is some pressure
to bring in money by creating projects. Jung-II Jin agreed with that but stated that the budget only grows a little and that the quality of the projects not the quantity is the important issue the Subcommittees should take care of.

13. **The International Year of Chemistry**

The International Year of Chemistry will be opened in January 2011 in Paris, the closing ceremony will be held in December 2011 in Bruxelles. Majda Žigon reported that the areas have been identified to make initiatives of the Division more transparent: on Conferences, the website, internet activities, a competition comprising essays (to be launched December 2010), a video contest (to be launched March 2011), interviews (experts, normal people, pupils, students...), brochures, flyers and posters. Chris Ober mentioned that there will be IUPAC-sponsored Conferences in 2011 in almost each continent and this gives a chance to draw attention to Polymer Science in the International Year of Chemistry. Input for the competitions and the website is asked for and very much appreciated. The contest should comprise video clips that show the importance of polymers in modern society, also interviews with distinguished experts in the field, etc. The budget situation, however, presently looks bad. Dennis Smith proposed to address the Society of Plastics Engineers and the Society of the Plastics Industry. Jean-Pierre Vairon suggested to contact that all National Representatives should involve the respective national societies and to have all leaders in the Polymer Society. Ram Prakash Singh suggested to contact the Indian Centre for Plastics. Mitsuo Sawamoto asked if there is any coordination on a higher IUPAC level. The answer was that the Bureau is presently not involved in any coordination, people have ‘free hands’ but Chris Ober should always be involved/informed about the activities. Joon-Soep Kim suggested to use YouTube for the contest as it is successfully practiced in the US.

14. **Reports on Strategy and Communication (Mitsuo Sawamoto)**

Mitsuo Sawamoto presented an up-dated version of the list and address of the world polymer organizations. Some societies, however, have not provided up-dates for some years. An electronic version is available from the Polymer Society of Japan. IUPAC is eager to increase communication among the Polymer Societies. The Division members are asked to provide ideas where and how polymer societies can be supported and developed. One example is the support of polymer scientists in Nepal by IUPAC sponsorship of the POLYCAR 19 Conference in Kathmandu in March 2011. Strategically, IUPAC can contribute to problems correlated with energy, sustainability, environmental protection and problems related with global warming. The next goals for polymer scientists have to be identified and made known to the scientific community and society in general. Jung-II Jin addressed this as a possible topic for next round table discussions at major meetings. Jean-Pierre Vairon suggested preparation and advertising on the Division website. Small special conferences could also be helpful in following this strategy. Ram Prakash Singh offered information for the website from his book covering exactly the subjects mentioned by Mitsuo Sawamoto.
15. Reports on Division-sponsored Conferences (Przemyslav Kubisa)

Each year IUPAC sponsors a large number of independently organized symposia that cover a wide range of specialized topics in chemistry. In general there is no financial support from IUPAC to conferences. Exceptions are conferences *New Directions in Chemistry - Scientifically Emerging Regions.* The financial support granted from IUPAC is of the order of USD 4000 per conference. Detailed information is provided by the IUPAC website. Sponsorship by IUPAC attests to the quality of the scientific program and indicates the host country's assurance that scientists from all countries may participate.

In general, IUPAC sponsored conferences should be international in the sense that they are intended to attract participants from anywhere in the world. Conferences that are mainly regional in nature may be eligible if IUPAC sponsorship would help attract a more international audience.

The members of the Division are asked to encourage conference organizers to apply for IUPAC sponsorship.

**IUPAC Sponsored Conferences – Polymer Division**

<table>
<thead>
<tr>
<th>Year</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of conferences</td>
<td>11</td>
<td>10</td>
<td>10</td>
<td>11</td>
<td>9</td>
<td>9</td>
<td>7</td>
<td>30*</td>
<td>11</td>
</tr>
<tr>
<td>No of publications in Macromol Symp</td>
<td>8</td>
<td>9</td>
<td>4</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>No of pages</td>
<td>1743</td>
<td>2903</td>
<td>1648</td>
<td>1821</td>
<td>1233</td>
<td>459</td>
<td>566</td>
<td>360</td>
<td></td>
</tr>
</tbody>
</table>

*All IUPAC sponsored Conferences

**Locations of conferences**

**2009**

Europe: 5 (France, Germany, Czech R., Poland, Austria)

N. America: 2 (USA, Canada)

Asia: 1 (China)

S. America: 2 (Chile, Chile)

Australia: 1

**2010**

Europe: 6 (Germany, France, UK, Czech R., Poland, Greece)

America: 1 (Jamaica)

Asia: 1 (China)

**IUPAC Polymer Division Sponsored Conferences - 2009**

- **Radical Polymerization**, Melbourne, Feb. 15-17 2009
• 17th International Conference on Polymer Characterization (POLYCHAR-17) World Forum on Advanced Materials, Rouen, April 20-24, 2009
• Frontiers in Polymer Science - International Symposium Celebrating the 50th Anniversary of the journal Polymer, Mainz, June 7-9 2009
• 2nd International Conference on Self-Healing Materials, Chicago, June 28 –July 1, 2009
• 13th International IUPAC Conference on Polymers & Organic Chemistry (POC-'09), Montréal, July 5-9 2009
• 73rd Prague Meeting on Macromolecules: New Frontiers in Macromolecular Science. Prague, July 5 - 9, 2009
• European Polymer Congress, Graz, Austria, July 12-17, 2009
• IP-09 Ionic Polymerization, Cracow, July 26-31, 2009
• 10th International Conference on Frontiers of Polymers and Advanced Materials, Santiago, Chile, September 28- October 2 2009
• International Symposium on Novel Materials and Their Synthesis (NMS-V), Shanghai, October 18-22, 2009
• 13th International Symposium on Macromolecular Complexes, Termas de Chillan, Chile, November 15-18, 2009

IUPAC Polymer Division Sponsored Conferences - 2010
• 18th International Conference on Polymer Characterization, Polychar, Siegen, April 7, 2010
• 8th International Conference on Polymer-Solvent Complexes and Intercalates, Strasbourg, July 5, 2010
• 43rd International Symposium on Macromolecules – IUPAC World Polymer Congress 2010, Glasgow, July 11, 2010
• 74th Prague Meeting on Macromolecules. Contemporary Ways to Tailor-Made Polymers. Modern Methods of Polymer Synthesis. Prague, July 18, 2010
• MAM-10. 5th International Symposium on Macro- and Supramolecular Architectures and Materials: New Science and Technologies for the Improvement of Human Living Standards. Montego Bay, Jamaica, August 15 2010
• 4th International Conference on Polymer Behavior, Lodz, Poland, September 20, 2010
• 6th International Symposium on Novel Materials and their Synthesis, Wuhan, China, October 11, 2010
• 8th Hellenic Society Symposium on Polymer Science and Technology, Hersonissos, Greece, October 24, 2010

Volume 277, 214 pages (February 2009)
6th International Symposium on Molecular Order and Mobility in Polymer Systems,
St. Petersburg, Russia, June, 2008
Volume 278, 113 pages (April 2009)

MACRO 2008, Polymers at Frontiers of Science and Technology, Taipei, June 2008
Volume 279, Pages 242 (May 2009)
2010 (2 Issues) – 360 pages

Macro- and Supramolecular Architectures and Materials, Dusseldorf, September 2008
Volume 287 Issue 1, 176 pages (January 2010)

POLYCHAR-17 World Forum on Advanced Materials, Rouen, April 2009
Volume 290 Issue 1, 184 pages (April 2010)

Incoming polymer conferences (some sponsored by IUPAC)
http://www.chemistry-conferences.com/topics/polymers.htm

2010, 18 - 21 November, Polymer Chemistry Conference 2010, Puerto Morelos (MX)
2010, 15 - 26 November, 2nd Conference on Chemical Engineering and Advanced Materials
VIRTUAL FORUM, Naples (IT)
2010, 11 -13 October, Biopolymers Symposium 2010, Denver (CO)
2011 26 - 29 April, Stellenbosch South Africa 11th UNESCO/IUPAC Workshop and Conference on
Functional Polymeric Materials and Composites
2011, 23-27 May Pretoria South Africa 11th International Conference on Frontiers of Polymers and
Advanced Materials
2011, 13-16 Feb. 32nd Australasian Polymer Symposium; Coffs Harbour, Australia
2011, 20.-24. March POLYCHAR 19 Kathmandu, Nepal
2011, 29-31 May, Frontiers in Polymer Science, Second International Symposium In association with
the journal Polymer (London), Centre de Congrès, Lyon, France
2011, 29 May- 1 June, Asia-Europe Symposium on Processing and Properties of Reinforced
Polymers, Dresden, Germany.

2011 – International Year of Chemistry – special year for IUPAC.
There are plans to have IUPAC sponsored polymer conferences in each continent. Activities related to
Polymer Division sponsored conferences in 2011 coordinated directly by Division President.
The preferred publishing journal of IUPAC-sponsored Conference contributions - Macromolecular
Symposia - dropped from the impact factor list in 2006 and also from Current Contents because since
then it was counted a sort of a conference proceeding – which in fact it is not. ISI plans since then to
open a new category but nothing has yet surfaced. In general, there is no real reason not to publish
selected contributions of IUPAC-sponsored conferences in Macromolecular Symposia, in particular
since the Division benefits from the royalties, see also topic 18 of these minutes. Publication coverage
of events sponsored by the IUPAC Polymer Division is usually offered to Macromolecular Symposia,
and the Conference Editor should direct any initial inquires about this option to the IUPAC Secretariat.

16. **New Project Areas (Vairon, Mormann)**

IUPAC has identified the problem of developing a better mechanism to encourage and fund multilateral international cooperation. Driven by the projects 2006-014-1-20 and 2006-013-1-20 several workshops with participants from national funding agencies from 16 countries have discussed this item. Despite the difficulties (many of them are administrational) the Committee on Chemical Research Funding (CCRF) was founded to overcome the problems and catalyze an international funding mechanism, standardize the procedures, clarify the definitions, provide guidance to developing countries on how to review and support research, etc.

As a pilot project in this field, the IUPAC Polymer Division Committee has started a project to foster international research cooperation using already established lines of bilateral cooperations between national science foundations. However, under the guidance of the internationally neutral IUPAC there should be at least three partners from three different countries. The call for proposals within this project was issued in August 2009 and published in Chem. Int. 31(5) Sept-Oct (2009) – IUPAC wire. The process is in full progress: The proposals are being evaluated by referees chosen by the IUPAC Polymer Division in accordance with the national funding organizations involved. The Selection Panel will meet during MACRO 2010 in Glasgow, July 2010. Final results will be made known to the applicants by September 15th 2010, and the start of the funding should not be later than January 2011.

17. **Future IUPAC WORLD POLYMER CONGRESSES**

Tim Long and Richard Turner (Virginia Tech) presented the Program of MACRO 2012, Blacksburg Virginia, 24th-29th of June 2012. The full service will be handled by professionals from Virginia Tech and the organizers are prepared to handle at least 1,500 participants. The break-even point was determined to be at about 1,400 participants. From the airports Dulles, Charlotte, and Roanoke (local airport) bus transportation to the campus is available. Accommodation in hotels close to the conference venue is possible from off about USD 80, on-campus accommodation for about 800 participants will be available for about USD 30-40/night. Up-dated information are available at [www.macro2010.org](http://www.macro2010.org). 10 Sessions are planned and 3 Poster Sessions. The Plenary Sessions will be available as live stream.

The fee for early registration will be USD 325 for regular participants and USD 125 for early student’s registration.

The speakers within the individual Sessions will be chosen by the Session organizers. In order to have the interests of the Polymer Division considered, Stan Penzcek suggested to send the list of proposed invited speakers to the Division President well in advance so that he could also identify some possible candidates and give feedback to the organizers. Chris Ober agreed pointing out that it is always better to respond to something than to a blank. Mitsuo Sawamoto asked if there are enough small lecture
rooms available, and the answer was ‘yes’ and all the rooms are within walking distance.

Mitsuo Sawamoto wanted to know in as how far technological aspects will be considered by the structure of the Sessions. The answer was that scientific developments frequently lead to technology transfers and that would certainly be reflected by the content of the Sessions, although technological contributions would probably appear in a smaller number. Jung-II Jin observed that some Subcommittees of the Polymer Division would like to organize specific Symposia on their topics within the framework of MACRO 2010, for example Characterization or Education. Early communication and feedback would be very convenient to optimize the organization. Mitsuo Sawamoto addressed the logo and the fact that the globes shown there all have the venue of the corresponding centre on their globe except for Taipei. The organizers stressed that the logo shown was just a draft and it would be looked after.

Jung-II Jin mentioned that care should be taken to present the three major Awards, namely the Samsung Young Scientists Award, the DSM Performance Materials Award, and the Polymer International IUPAC Award are provided with the adequate ceremonial frame and time during the Conference. The organizers assured that this has already been considered.

Since the biennial MACRO Conferences always happened to be a ‘family meeting’ of the Polymer Division, there should be close contact with Dick Jones concerning the organization of the Subcommittee and the Division meetings. There should also be a mutual link between the Conference website and the Division website.

A list of e-mail addresses should be available through Peter Lovell and the RCS. The Conference Proceedings should be published by Wiley-VCH Macromolecular Symposia. Only keynote and certain invited speakers should be placed in Pure and Applied Chemistry. Michael Buback stressed that efficient and early communication should be ensured and he suggested to have a meeting of the important people involved in the organization next year during the GA in San Jose.

Peter Lovell, representing the organizers of MACRO 2010 in Glasgow (MACRO Group UK and the RSC), gave a final report about the Conference being about to start. The MACRO Group UK and RSC both cover the expenses of the Division meeting. The response to the Conference was overwhelming, twice as much applications than could be accepted. There were 1622 pre-registered participants from 51 different countries, well distributed over the globe. 16% of the participants were from industry, 32% were students. The contributions consisted of 8 plenary talks, 41 keynote speakers (for none of the special speakers all costs were covered), 79 invited talks and 420 contributed presentations in 11 parallel Sessions. In addition there were more than 1000 poster contributions. Two Satellite Symposia were organized, namely on education and for nurturing and networking young scientists. Two symposia were run by industry. Everybody is expecting an exciting week with a number of special social programs.

There were no contributions presented by the applicants for the following MACRO Conferences in 2014 and 2016. These presentations were postponed to the next meeting in San Jose, 2011.
18. Budget, Projects and Division Structure (Chris Ober)

Chris Ober summarized the mission and objectives of IUPAC: Promoting norms, values and ethics of science, advocating free exchange of scientific information and access of scientists with a free and unrestricted flow of information; bringing global issues as a scientific, international non-governmental objective body to the attention of the society.

He gave a short review of the structure of IUPAC and in particular the Polymer Division and listed the new Division IV Projects:

<table>
<thead>
<tr>
<th>Title</th>
<th>Project Number</th>
<th>Task Gp. Chair</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic guidelines to polymer nomenclature</td>
<td>2008-032-1-400</td>
<td>Hiorns</td>
</tr>
<tr>
<td>International Tutorial in Polymer Characterization -- 18th POLYCHAR short Course</td>
<td>2009-015-1-400</td>
<td>Mormann</td>
</tr>
<tr>
<td>Data Treatment in SEC and Other Techniques of Polymer Characterization. Correction for Band Broadening and Other Sources of Error</td>
<td>2009-019-2-400</td>
<td>Meira</td>
</tr>
<tr>
<td>Definitions and Notations Relating to Stereochemical Aspects in Polymer Science</td>
<td>2009-047-1-400</td>
<td>Hellwich</td>
</tr>
<tr>
<td>Critically evaluated rate coefficients associated with initiation of radical polymerization</td>
<td>2009-050-1-400</td>
<td>Moad</td>
</tr>
<tr>
<td>Terminology for Chain Polymerization</td>
<td>2010-007-1-400</td>
<td>Moad</td>
</tr>
<tr>
<td>Postgraduate Course in Polymer Science</td>
<td>2010-015-1-400</td>
<td>Kratochvil</td>
</tr>
<tr>
<td>Structure, Processing and Performance of Ultra-High Molecular Weight Polyethylene</td>
<td>2010-019-1-400</td>
<td>Bucknall</td>
</tr>
</tbody>
</table>

The budget situation can be summarized as follows (for a detailed list see Appendix 2):

<table>
<thead>
<tr>
<th></th>
<th>Budget/USD</th>
<th>USD</th>
<th>Balance/USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>IUPAC</td>
<td>56,500</td>
<td>13,830</td>
<td></td>
</tr>
<tr>
<td>Samsung Fund</td>
<td>44,490</td>
<td>13,990</td>
<td></td>
</tr>
<tr>
<td>Wiley-VCH</td>
<td>13,980</td>
<td>5,468</td>
<td></td>
</tr>
<tr>
<td>Division Reserve</td>
<td>2,000 (+?)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum</td>
<td><strong>114,970</strong></td>
<td><strong>33,288</strong></td>
<td></td>
</tr>
<tr>
<td>Expenditures, Commitments</td>
<td>81,682</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The amount of USD 33,288 can possibly be used to fund some activities (projects) of the Division during the International Year of Chemistry. Chris Ober recalled the importance of launching new projects and called back the procedure to get a project on the road.
Recent reports about successfully finished projects are:

**Recommendations and Technical Reports**

Terminology for reversible-deactivation radical polymerization previously called "controlled" radical or "living" radical polymerization, *Pure Appl. Chem.*, 2010, Vol. 82, No. 2, pp. 483-491

Glossary of class names of polymers based on chemical structure and molecular architecture *Pure Appl. Chem.*, 2009, Vol. 81, No. 6, pp. 1131-1186


Glossary of class names of polymers based on chemical structure and molecular architecture *Pure Appl. Chem.*, 2009, Vol. 81, No. 6, pp. 1131-1186


**Education**

Postgraduate Course – Prague, (joint with UNESCO)

Short Course Polymer Characterization (in correspondence with –Polychar 18, Siegen, Germany)

Establishment of Distance Learning Material in Polymers –Moscow

Polymer Courses for African Countries – Stellenbosch (joint with UNESCO)


**Conferences**

The Polymer Division sponsors International Conferences in the member countries, gives significant funding for Conferences in economically disadvantaged countries that are full IUPAC members including free Publicity in Chemistry International and on the IUPAC and Division websites, publication of selected Conference contributions are encouraged, slots are available in *Macromolecular Symposia*. Conferences sponsored in the years 2009-2011 are given in Appendix 4. The number of Conferences has dramatically decreased during recent years:
The International Year of Chemistry 2011 to celebrate the 100\textsuperscript{th} anniversary of the Nobel Prize to Marie Sklodokowska Curie for her discovery of the elements Polonium and Radium is a welcome opportunity to serve as:

- a focal point for activities by national chemical societies, educational institutions and non-governmental organizations
- enhance the understanding and appreciation of chemistry among the public
- promote the role of chemistry in contributing to solutions to many global problems
- build capacity by engaging young people with scientific disciplines
- serve as a catalyst for international cooperation

Chris Ober called up the IUPAC Prize for Young Chemists for the most outstanding PhD-Thesis ([www.iupac.org](http://www.iupac.org)) and recalled the awardees of The DSM Performance Materials Award (in 2010 to Han E. H. Meijer, NL), and the Polymer International IUPAC Award (in 2010 to Molly Stevens, UK).

Finally, Chris Ober encouraged the Division to use their personal contacts and invite observers to the Subcommittee and Working Parties’ meetings. In particular the number of female members in the Division is very low. Dušan Berek lamented in this context the limitations caused by only 10 NRs.

19. Vice-President’s Remarks (Michael Buback)

A number of 5 Division Officers/TMs have to be elected for the next 4 years period. The election procedure for Officers and TMs is conducted by the Secretariat with a strict time schedule. The election of AMs may still be organized by the Division. A Nominating Committee has been formed consisting of the Division’s Vice-President, Pavel Kratochvil, Kris Matyjaszewski, Michael Dröschler and Isio Isado. NR’s can still be appointed by the Division, the limited number of 10 NR’s was still strongly criticized. However, a change of the corresponding by-law requires action of the NAO’s.

Michael Buback stressed the necessity to keep and develop contact with developing countries, such as South Africa and the South-and Central-American countries. The visibility of the Division’s activities is
essential for the impact of the Division’s efforts. The Division’s activities have to be published and made public, for example on Polymer-related Conferences. Industrial contacts have to be nursed and improved and participation of the industry in Polymer Conferences should be encouraged. All Division Members are asked to use their contacts accordingly. The activities of IUPAC and the benefit for the global society have to become more evident to public. Michael Hess suggested to directly address industry and ask for input which types of projects in particular interest in the industrial field and offer our support.

The role of NR’s should be strengthened but at the same time the NRs should be more supported by their NAOS. The Division as well as the Subcommittees should more frequently use the option of inviting observers who eventually can be recruited as regular members. Since Polymer (Materials) Education always was in the focus of the Polymer Division the question was raised to create a Polymer Education Award. Support by a company was put into the discussion and the name ‘Staudinger Award’ was proposed. IUPAC sponsorship of Conferences is usually not correlated with financial support. It was proposed to directly grant IUPAC stipends to students participating (actively) in an IUPAC Conference.


No further decisions, conclusions were made and any further topics were forwarded to the next meeting. Finally, Chris Ober and Michael Buback closed the 2010 Meeting of the IUPAC Polymer Division thanking all participants for their lively contributions.

20. Any Other Business

Since there was no further business identified the Division President thanked all Members, Observers, and guests for their vivid and active participation in the 2010 Division meeting and led over to the final topic.

21. Date of Next Meeting

The President thanked all participants for their contributions and expressed his best wishes for a safe travel home and looking forward to see everybody next year again in good health.

The Division meeting in 2011 will be held during the 46th IUPAC General Assembly in San Juan, Puerto Rico, July 30th to August 07th 2011.

Michael Hess, August 2010, Secretary
Appendix I

IUPAC Polymer Division Meeting 2010

Rooms 432 and 426, Department of Electronic and Electrical Engineering Royal College, University of Strathclyde, Glasgow, Scotland

9.30–12.30 & 14.00–17.30, July 10th, 2010; 9.00–12.30, August 11th, 2010

After some changes of the sequence of the Agenda it finally reads:

Agenda

First Day

1. President’s Introductory Remarks and Finalizing of the Agenda
2. Apologies for Absences
3. Approval of the Minutes of the Division Committee Meeting, Taipei, June 2008
4. Matters Arising
5. Report on Structure–Property Projects (Dick Dijkstra)
Projects (Dick Jones, Roger Hiorns)
7. Report on Molecular Characterization Projects (Dusan Berek)

Photosession during break

9. Report on Division Web Page and Electronic Publications (Dick Jones)
10. Report on Polymerization Projects (Greg Russell)
11. Report on Education Projects and Activities (Jean-Pierre Vairon)
12. Monitoring of Projects (Michael Buback)
13. International Year of Chemistry (Majda Žigon)
14. Strategy, Communication (Mitsuo Sawamoto)
15. Reports on Division-sponsored Conferences (Przemyslav Kubisa)

Second Day

16. New Project - Areas International Funding Cooperation (Werner Mormann)
17. Future IUPAC World Polymer Congresses (USA, Thailand) (Chris Ober)
18. Budget, Projects and Division Structure (Chris Ober)
19. Vice-President’s Topics (Michael Buback)
20. Any Other Business (Chris Ober)
21. Date of Next Meeting (Michael Hess)
### APPENDIX 2

#### Project Expenses vs. Budget

<table>
<thead>
<tr>
<th>Through 6 July 2010</th>
<th>Actual</th>
<th>Budget</th>
<th>Over / (Under)</th>
<th>% of Budget</th>
<th>Planned End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>400-Macra</td>
<td>20,500.00</td>
<td>44,490</td>
<td>(13,990)</td>
<td>69%</td>
<td>31-Dec-2010</td>
</tr>
<tr>
<td>Wiley VCH Rovinj</td>
<td>6,512.00</td>
<td>13,910</td>
<td>(7,400)</td>
<td>57%</td>
<td>31-Dec-2010</td>
</tr>
<tr>
<td>1995-020-1-400 Bailey</td>
<td>6,000.00</td>
<td>6,000</td>
<td>0</td>
<td>100%</td>
<td>31-Dec-2010</td>
</tr>
<tr>
<td>2000-028-1-400 Russell</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>100%</td>
<td>31-Dec-2010</td>
</tr>
<tr>
<td>2002-077-1-400 Sannarella</td>
<td>2,050.00</td>
<td>2,000</td>
<td>50</td>
<td>100%</td>
<td>1-Dec-2008</td>
</tr>
<tr>
<td>2003-001-1-400 Watson</td>
<td>6,000.00</td>
<td>6,000</td>
<td>0</td>
<td>100%</td>
<td>1-Dec-2008</td>
</tr>
<tr>
<td>2003-049-1-400 Allegre</td>
<td>4,975.00</td>
<td>4,975</td>
<td>0</td>
<td>100%</td>
<td>1-Dec-2008</td>
</tr>
<tr>
<td>2003-050-2-400 Macra</td>
<td>3,500.00</td>
<td>3,500</td>
<td>0</td>
<td>100%</td>
<td>1-Dec-2008</td>
</tr>
<tr>
<td>2003-052-1-400 Almeida</td>
<td>4,472.00</td>
<td>4,472</td>
<td>0</td>
<td>100%</td>
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#### Project Expenses vs. Budget

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<th>Through 26 August 2009</th>
<th>Actual</th>
<th>Budget</th>
<th>Over / (Under)</th>
<th>% of Budget</th>
<th>Planned End Date</th>
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<td>2006-041-1-400 Hess</td>
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<td>2007-041-1-400 Hiltmann</td>
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<td>2007-061-1-400 van Sassen</td>
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<td>5,000</td>
<td>0</td>
<td>100%</td>
<td>31-Dec-2010</td>
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<tr>
<td>2007-071-1-400 Singh</td>
<td>3,500</td>
<td>3,500</td>
<td>0</td>
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<tr>
<td>2007-091-1-400 Kraschalek</td>
<td>5,000</td>
<td>5,000</td>
<td>0</td>
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</tr>
<tr>
<td>2007-092-1-400 Gilchrist</td>
<td>-</td>
<td>6,000</td>
<td>(6,000)</td>
<td>100%</td>
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<tr>
<td>2008-013-1-400 Marmann</td>
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<td>-</td>
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<tr>
<td>2008-034-1-400 Aul</td>
<td>-</td>
<td>5,000</td>
<td>(5,000)</td>
<td>100%</td>
<td>31-Dec-2010</td>
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<tr>
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<td>-</td>
<td>3,000</td>
<td>(3,000)</td>
<td>100%</td>
<td>31-Dec-2010</td>
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</table>
APPENDIX 3

Application for Sponsorship

An application for IUPAC Sponsorship must be made preferably 2 years and at least 12 months before the Conference.

The granting of sponsorship by IUPAC is judged on the following criteria:

(i) scientific quality
(ii) significance of conference
(iii) suitability of conference
(iv) evidence of sufficient advanced planning
(v) suitable time spacing of conferences of a similar type
(vi) rotation of leadership for conferences in a series or of a similar type
(vii) geographically diverse International Advisory Board
(viii) participation of industrial chemists and women as speakers and as members of the International Advisory Board

In general, IUPAC sponsorship of a conference or symposium attests to its quality but does not carry financial support. However, Divisions and Standing Committees of IUPAC may apply for financial support via two programs for Conferences:

- New Directions in Chemistry
- Scientifically Emerging Regions

Publication coverage of events sponsored by the IUPAC Polymer Division is usually offered to Macromolecular Symposia (Wiley-VCh), and the Conference Editor should direct any initial inquiries about this opinion to the IUPAC Secretariate.
### APPENDIX 4

**Conferences 2009/2010/(2011)**

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Event Title</th>
<th>Organizer</th>
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</thead>
<tbody>
<tr>
<td>July 26 -31, 2009</td>
<td>Krakow, Poland</td>
<td>19th IUPAC International Symposium on Ionic Polymerization (IP ‘09)</td>
<td>S. Penczek</td>
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<tr>
<td>July 12-16, 2009</td>
<td>Graz, Austria</td>
<td>European Polymer Congress 2009</td>
<td>F. Stelzer</td>
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<tr>
<td>July 5 -9, 2009</td>
<td>Prague, Czech Republic</td>
<td>New Frontiers in Macromolecular Science: From Macromolecular Concepts of Living Matter to Polymers for Better Quality of Life</td>
<td>M. Dušková</td>
</tr>
<tr>
<td>July 5 -9, 2009</td>
<td>Montreal, Canada</td>
<td>13th International IUPAC Conference on Polymers and Organic Chemistry (POC-‘09)</td>
<td>W. Skene</td>
</tr>
<tr>
<td>June 26 - July 1, 2009</td>
<td>Chicago, USA</td>
<td>2nd International Conference on Self-Healing Materials</td>
<td>S. Olugebefola</td>
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<tr>
<td>June 7 -9, 2009</td>
<td>Mainz, Germany</td>
<td>Frontiers in Polymer Science - International Symposium Celebrating the 50th Anniversary of the Journal &quot;Polymer&quot;</td>
<td>A. Müller</td>
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### 2009 (cont’d)

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Event Title</th>
<th>Organizer</th>
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<tbody>
<tr>
<td>Feb. 15 -17, 2009</td>
<td>Melbourne, Australia</td>
<td>Materials of the Future-Science of Today: Radical Polymerization</td>
<td>G. Moad</td>
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<td>April 20-24, 2009</td>
<td>Rouen, France</td>
<td>PolyChar 17 - World Forum on Advanced Materials</td>
<td>A. Salter</td>
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<tr>
<td>Sept. 28 - Oct. 2, 2009</td>
<td>Santiago, Chile</td>
<td>10th International Conference on Frontiers of Polymers and Advanced Materials</td>
<td>G. González</td>
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<tr>
<td>Nov 15 - 18, 2009</td>
<td>Termas de Chillán, Chile</td>
<td>13th International Symposium on MacroMolecular Complexes</td>
<td>B. Rivas</td>
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### 2010

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Event Description</th>
<th>Speaker</th>
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</thead>
<tbody>
<tr>
<td>April 7 - 9, 2010</td>
<td>Siegen, Germany</td>
<td>18th International Conference on Polymer Characterization; World Forum on Advanced Materials</td>
<td>W. Mormann</td>
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<tr>
<td>July 5 to 8, 2010</td>
<td>Strasbourg, FR</td>
<td>8th International Conference on Polymer-Solvent Complexes and Intercalates</td>
<td>J.-M. Guenet</td>
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<tr>
<td>July 18-22, 2010</td>
<td>Prague, Czech Rep.</td>
<td>74th Prague Meeting on Macromolecules: Contemporary Ways to Tailor-Made Polymers</td>
<td>P. Vlček</td>
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<tr>
<td>August 15 - 20, 2010</td>
<td>Montego Bay, Jamaica</td>
<td>5th International Symposium on Macro- and Supra-molecular Architectures and Materials</td>
<td>I. A. Kahwa</td>
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<tr>
<td>Sept 20-23, 2010</td>
<td>Lodz, Poland</td>
<td>4th International Conference on Polymer Behavior</td>
<td>A. Galeski</td>
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### 2010 (Cont’d) & 2011

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Event Description</th>
<th>Speaker</th>
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</thead>
<tbody>
<tr>
<td>Oct 24 to 29, 2010</td>
<td>Hersonissos, Greece</td>
<td>8th Hellenic Society Symposium on Polymer Science and Technology</td>
<td>M. Pitsikalis</td>
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<tr>
<td>Dec 10 - 16, 2010</td>
<td>Tiruchengode, India</td>
<td>International Conference on Nanomaterials and Nanotechnology 2010</td>
<td>V. Rajendran</td>
</tr>
<tr>
<td>April 26 - 29, 2011</td>
<td>Stellenbosch, SA</td>
<td>11th UNESCO/IUPAC Workshop and Conference on Functional Polymeric Materials and Composites</td>
<td>H. Pasch</td>
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<tr>
<td>May 23 - 27, 2011</td>
<td>Pretoria, SA</td>
<td>11th International Conference on Frontiers of Polymers and Advanced Materials</td>
<td>Walter Focke</td>
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